July 1961

Modern Metals

JUL 27 1961

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Extrusion Buyers Say:

"Extrusions cost too much; quality is poor; delivery too slow."

"More standard shapes, better price setup needed for small users."

"Extruders should quit competing with their customers."

"We could use more design and engineering help."

"Closer tolerances, better finishes, technical help needed."

"More realistic credit policies would help."

"Extruders should offer samples for experimentation."

"They shouldn't encourage novices to enter the window business."

"We need more time to amortize die costs."

"Extruders should help us promote sales to consumers."

"They peddle our product ideas to other manufacturers."

"Extruders should offer shapes with baked-on enamels in color."

Equipment Makers Say:

"About 30% of extrusion equipment in use today is obsolete."

"Equipment orders from Japan, South America, South Africa, India, are increasing."

"We notice no marked trend toward leasing of extrusion equipment."

Modern Metals surveys an industry still suffering its growing pains; gathers gripes from all segments

ormula for stability: New markets; better lling; responsible management (page 31).

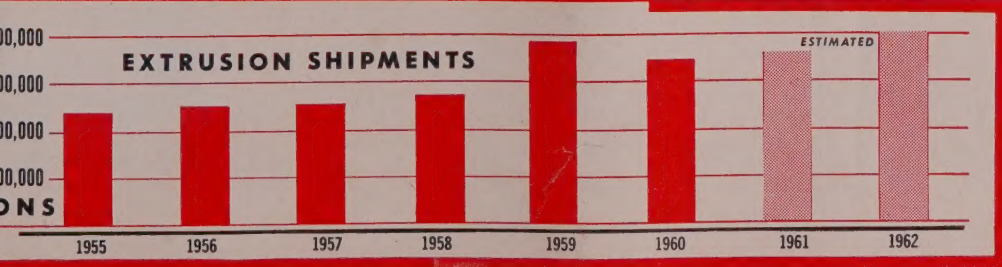
Extruders Say:

"Some independents lack the guts to ask for a fair price."

"Prime producers subsidize extrusion operations with their pig profits."

"Profits extremely depressed. Some independents don't look at their costs until the sheriff walks in."

"Some are selling at below cost; giving unwarranted credit."



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10SC61

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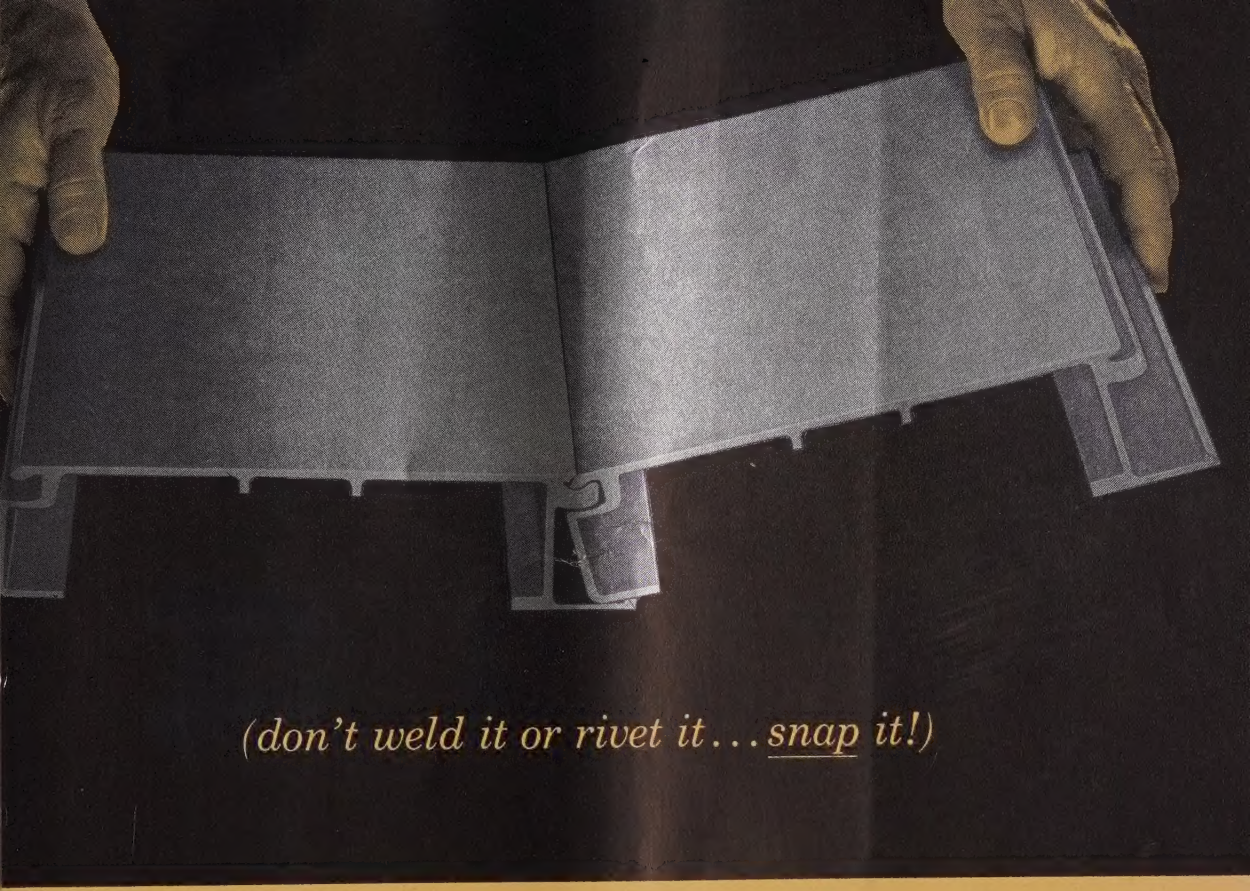


(don't weld it or rivet it... snap it!)

New way to build a box—or a wall—or a floor

Reynolds Aluminum Interlocking Extrusions

Reynolds Aluminum interlocking extrusions actually give you another choice in fabricating methods—a really efficient, cost cutting choice. Sections can be joined together, securely, permanently. Thus, you can produce an aluminum panel that's lightweight, strong, and rigid, with no welding or riveting. See next page for details.

Reynolds Aluminum Interlocking Extrusions

Here's a new, cost-cutting way to put a panel together —a panel made with strong, lightweight, rustfree Reynolds Aluminum. The new fabricating method: Reynolds Aluminum interlocking extrusions.

With these extrusions, and their exclusive design, you can build a strong, rigid wall, or floor, or panel by interlocking sections together. You eliminate a lot of welding and a lot of rivets; and the joints are secure, strong, and permanent.

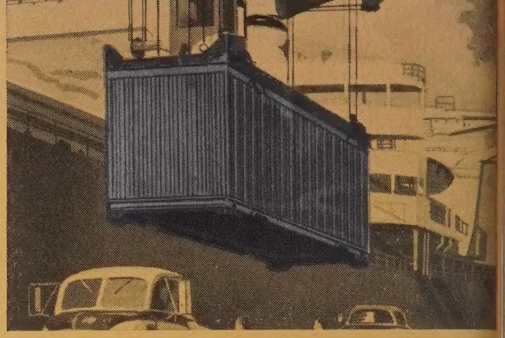
The panel you build with Reynolds interlocking extrusions is really solid, because the design provides an integral reinforcing brace at every joint . . . or between joints as required.

You can achieve major production savings with fast, efficient interlocking fabrication methods, but the savings don't end there. With Reynolds Aluminum extrusions, you can pre-fabricate sections of panels conveniently in a shop, assemble or erect the sections easily and quickly at the job site.

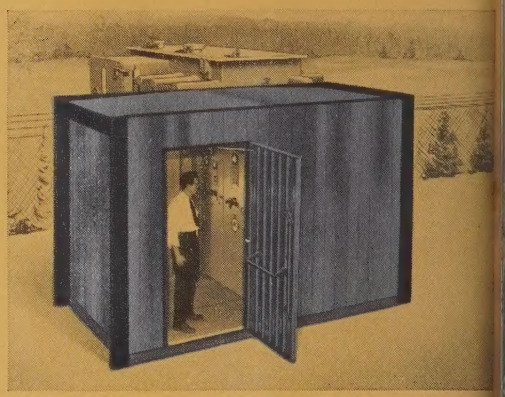
Although the basic idea behind all Reynolds interlocking extrusions is the same, the design can be varied to meet specific job requirements. Already, variations of the interlocking extrusion idea have proved themselves, in production and performance benefits, in such wide-ranging uses as electrical switchgear housing, truck and refrigerator car flooring, ship deckhouses, airplane hangar doors, containers, and temporary or portable tool houses.

If you have a "box" to build (from a small container to a warehouse building) or a floor or a panel of any kind, see how many rivets you can save, and how much welding. Investigate Reynolds Aluminum interlocking extrusions. For details, contact your local Reynolds office, or write *Reynolds Metals Company, P.O. Box 2346-GM, Richmond 18, Virginia.*

Watch Reynolds TV show
"Harrigan & Son", Fridays—ABC-TV

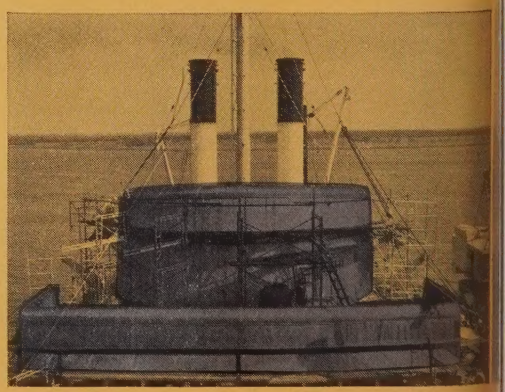


Containers made with Reynolds interlocking extrusions combine aluminum's light weight with extra strength and rigidity.

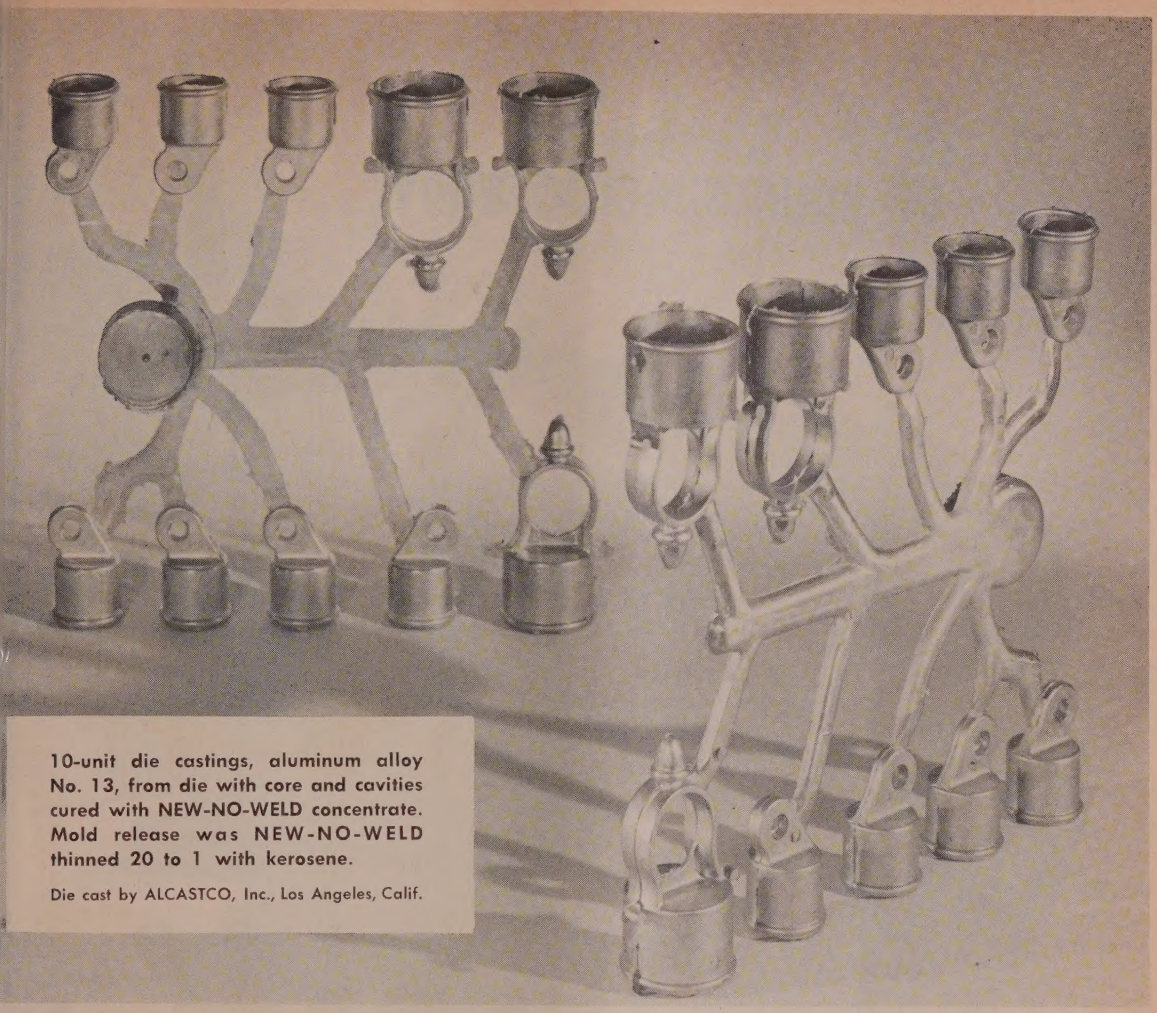


Electrical substation unit built with Reynolds extrusions is strong, rigid, thanks to integrally-reinforcing extrusion design.

Truck flooring made with Reynolds extrusions is available in a range of designs using interlocking principle.



Reynolds extrusions cut welding time, fabrication and erection costs in construction of



10-unit die castings, aluminum alloy No. 13, from die with core and cavities cured with NEW-NO-WELD concentrate. Mold release was NEW-NO-WELD thinned 20 to 1 with kerosene.

Die cast by ALCASTCO, Inc., Los Angeles, Calif.

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NEW-NO-WELD is similar in appearance to regular NO WELD (only a competent chemist could determine the chemical difference), *but* the die caster will notice the difference when he switches to NEW-NO-WELD.

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***Plant* tests for over two years now prove that rejects caused by welds and galling go down when you change to NEW-NO-WELD.**

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MODERN METALS
Read in companies that produce, fabricate and cast aluminum, magnesium and titanium, and firms that use these metals in manufacturing end products.

HE COVER: Things could be worse e extrusion industry. Extruders who l to Modern Metals' survey of their ry indicate that they'll use 20% more num this year than last. Extrusion who answered another Modern Metals expect to buy 15.4% more extrusions ear. The survey provides a timely t into industry conditions. The sum- begins on page 31.

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Modern Metals

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The extruders expect to be pushing more aluminum this year than last; extrusion users expect to be buying more shapes; equipment firms see a slight rise in orders.

EXTRUSION CLADDING ..... Fiorentino, Slunder, Wagner 38
Battelle metallurgists describe successful application of the process using aluminum as the cladding material, uranium as the core. Applications are cited.

SPRAY LUBRICANT SPEEDS EXTRUSION OUTPUT 42
Use of 'dag' dispersion reduces lubricating time, prolongs die life, cuts die renovation time, minimizes die pickup.

EXTRUSIONS STRENGTHEN HIGHWAY BRIDGE 44
New bridge is strong, yet weighs less than one-third as much as a comparable steel span. Reynolds Metals Co. believes the bridge to be price competitive with steel and concrete.

EXTRUSION PLANT SAFETY ..... A. M. Murphy 46
Making extrusions is a hazardous occupation because of the enormous pressures that power the equipment. An expert offers tips on how to avoid accidents that can kill or maim.

EXTRUSIONS MAKE STRONG TRAILER FLOORS ..... G. Keith Glaza 52
Dow Chemical Co.'s giant extrusion press produces wide aluminum extrusions to form floor surface with integral I-beam cross members.

ALUMINUM, NEOPRENE EXTRUSIONS SAVE TIME, MONEY 54
New curtain wall system hermetically seals walls, eliminates metal-to-glass contact, offers economies of mass production, erects speedily to minimize labor expense.

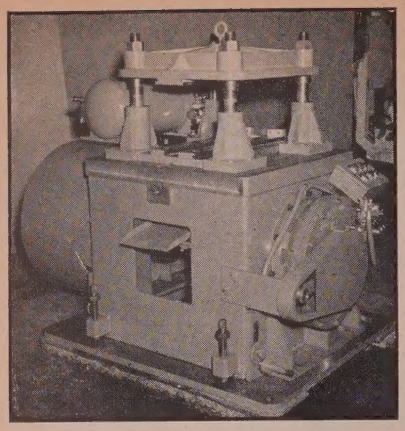
HOW TO SLASH SCRAP HANDLING TIME 58
Extruder uses self-dumping hoppers; cuts handling time 50%.

CRACKED EXTRUSION BILLETS ..... W. W. Frank 60
Plant metallurgist explains how his firm, an independent extruder, guards against production of cracked billets.

EXTRUSIONS GIVE SCREEN SYSTEM DESIGN VERSATILITY 64
Extruded aluminum panels, mullions, other components fit together to create nearly any design effect in remodeling facades, solar screens, enclosures, vision barriers, etc.

ALUMINUM TOPS IN TRANSMISSION TOWERS ..... H. K. Darby 68
Costly painting is avoided wherever aluminum can be used for tower lines. Aluminum experts think the metal will become an important specialty material rather than be used for entire tower. Design requirements are a big cost factor.

PRIMARY PRODUCER TELLS EXTRUDERS ..... D. A. Rhoades 76
Profit on ingot and billet is small; new markets must be found; foreign competition is destructive. Kaiser Aluminum's president says industry-sponsored promotion program is needed.



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Letters

Voice of What?

Sirs:

I think your idea of developing a motto to go with your cover name is a good one. Since you have asked for suggestions, what would you think of: "Modern Metals—Voice of Progress," or "Modern Metals—Voice of the Future?"

"J"—Illinois

MM—If the cutthroat artists aren't soon eliminated and aluminum prices aren't soon going back to near published prices, this magazine may have a title like: "Voice of What Could Have Been," or "Steel, the Stable Metal," or "Copper, the Surviving Metal," or even, "Zinc, the One that Lasted."

Funny thing about the title "Modern Metals." We're frequently asked why stainless steel isn't included? A good question—if the stuff didn't need nickel as an alloying ingredient, which fluctuates price-wise as does tin. The boys at International Nickel decided they needed more money two weeks ago; upped their selling price enough to upset stainless prices for some time to come. When you're at the mercy of a monopoly such as INCO, you're living dangerously.

The Feild Twins: 81 Years Young

Sirs:

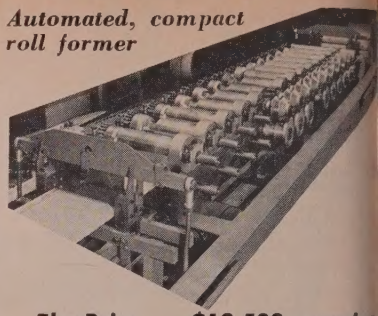
In the process of reading Modern Metals May issue, in "Here and There" I got to "Wheels Next Big Auto Use." The idea struck me, "Wheels the next big aluminum use."

Back in the late '90's I worked in a sporting goods store, selling and repairing bicycles. I had an early Columbia 52-incher. Rode it everywhere, then swapped it to my brother for a Viking safety type which had single tube tires. I acquired a Columbia chainless, a Crescent chainless, then a Columbia racer—around 1900. I then took a Columbia safety to the University of Arkansas in 1901 and rode it all up and down the hilly streets.

Well, to back track, a gentleman by the name of Claudius Jones came into the shop to show us his aluminum bicycle. In those days we had no wheel guards, no chain guards, no coaster brakes. The machines

"SIDEKING"

Automated, compact roll former



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One man—or a woman—can le change-overs where you'd nor- y use a crane or call several men ıeir jobs. Aluminum jigs are easier t up, open, close and store.

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Call The Aluminum Man, your local Alcoa Distributor Salesman

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Use order form on page 93.

weighed about 20 pounds, and if you know anything about bicycles they were rated at 60-, 70-, 72- and 84-gear, which referred the safety to that of a high wheeler which equalled one revolution of the pedals. For instance, a 60-gear would travel 15.71 ft., and an 84-gear would travel 21.99 ft.

Well, the aluminum bicycle was light, but expensive. So get a little promotion going and build a 72-gear aluminum bicycle, minus wheel guards and chain guards for the boys—and girls too—for they now ride in shorts. And sell 'em cheap.

I am going to take my high-wheel to the University of Arkansas at Fayetteville June 2nd and ride about the town square and the campus, just to show off. Sort of a sentimental journey 60 years afterward.

"W"—Ark.

MM—We now find that our oldest living subscriber (81) is not only a hot-rodder but that he also has a living twin.

Must be a wild climate in Arkansas.

Wants Spun Parts

Sirs:

In your June, 1961 issue a reader who signs himself "W"—Michigan requests a source for small spun aluminum parts as well as one and two quart cans. Would you be kind enough to forward us the name of this company so that we can send them suitable literature.

"R"—New Jersey

MM—We have sent along your letter, plus others, to "W" of Michigan.

Chrome Plating Source For Extrusions

Sirs:

We are anxious to contact an American source capable of chrome plating aluminum extrusions for us. . . . If you can put us in touch with such a firm, we will appreciate it very much. . . .

"J"—Quebec

MM—If any finishing firm is interested in doing this type of work for a Quebec firm, we'll put you in touch.

Norway's Magnesium Is Still Government Controlled

Sirs:

In "Looking Ahead," you comment on "major changes in world magnesium" in a way so misleading with regard to the activities of this company that we feel obligated to send you the following information . . .

For years we have been proud to be the major supplier of magnesium to Volkswagenwerk and the rapidly growing German market. It is quite absurd to say that we "moved into the German market last year," and we are wondering from where you could have obtained such information.

Although the Norwegian Government holds a great interest in our firm, it is not a majority stockholder, and therefore, it is also misleading to speak of "Norway's Government-controlled magnesium industry."

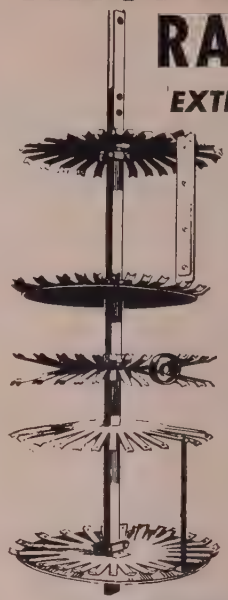
"N"—Norway

MM—What we should have said was that you moved into the German market in a big way last year by cutting magnesium prices below the market.

As for who controls your company, we'll always say that when any government owns a big chunk of a corporation, it controls it. Furthermore, we believe the record reveals that the Norwegian government put up the money to rebuild the magnesium plant after World War II, while your company acted as agent in purchasing the needed replacement equipment.

ANODIZING RACKS

EXTRUDERS!



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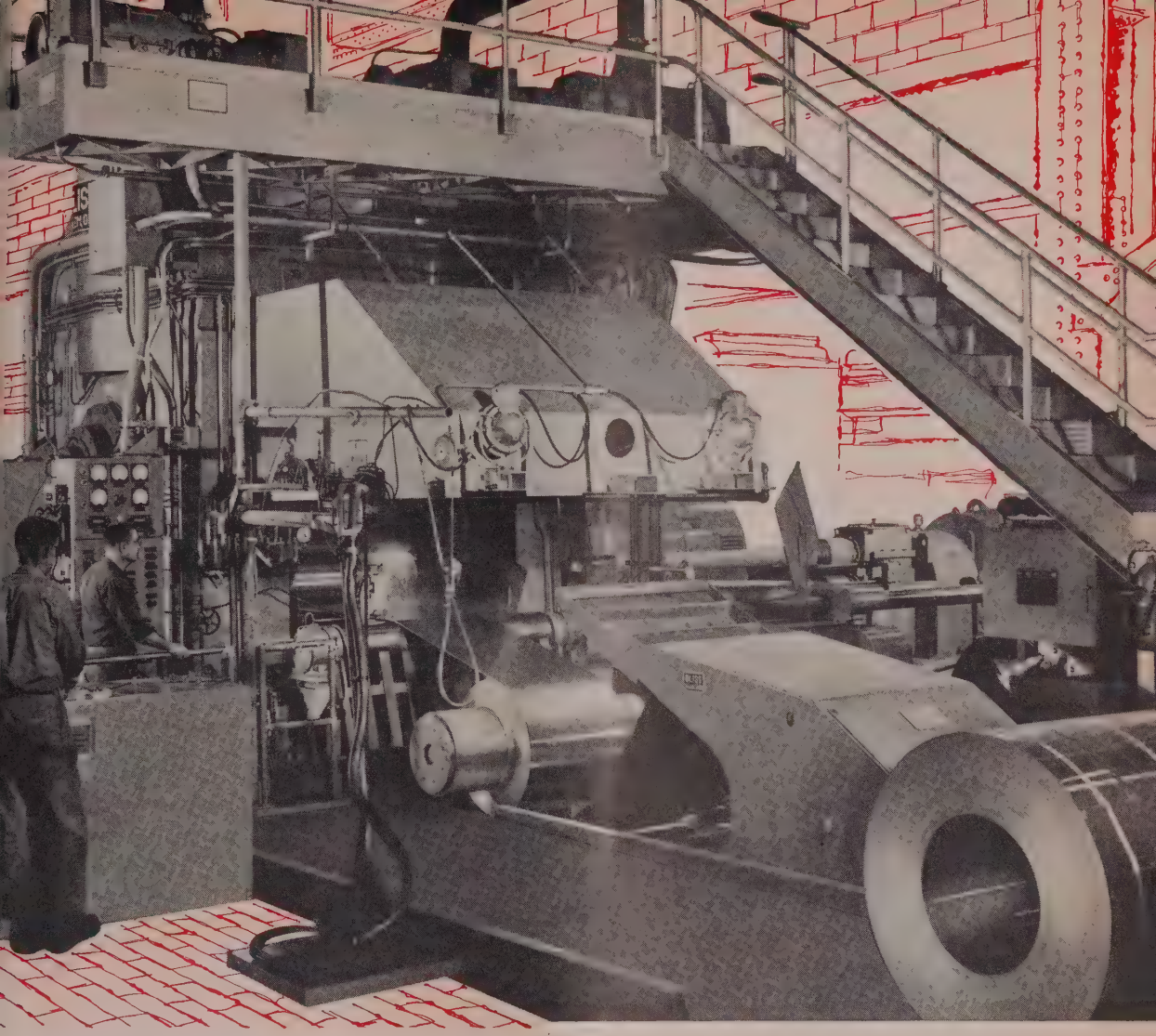

SAYS ANACONDA ALUMINUM:

One good mill deserves another

Picking a Bliss rolling mill for their new aluminum plant in Terre Haute, Indiana, was easy for Anaconda Aluminum Company: for years these mills have had an outstanding performance record in the aluminum industry.

A new Bliss 14″ x 49″ x 66″ four-high one way cold mill capable of speeds up to 1200 fpm, it is equipped with the auxiliaries necessary to produce aluminum coiled sheet in 60″ widths and at specified thicknesses as fine as .006″. Bliss supplied the mill with complete entry and delivery equipment, including entry coil conveyor, coil lowering device, coil preparation station, mandrel-type payoff reel, coil buggy, and tension reel and coil buggy.

Anaconda's operation brought the "best" out of the Bliss mill as plant management found its production record to be excellent and economical, too. This installation is just one more example of the acceptance of Bliss rolling mill equipment. For others, in both ferrous and non-ferrous operations, write us today for a copy of our 84-page Rolling Mill Brochure, Catalog 40B.

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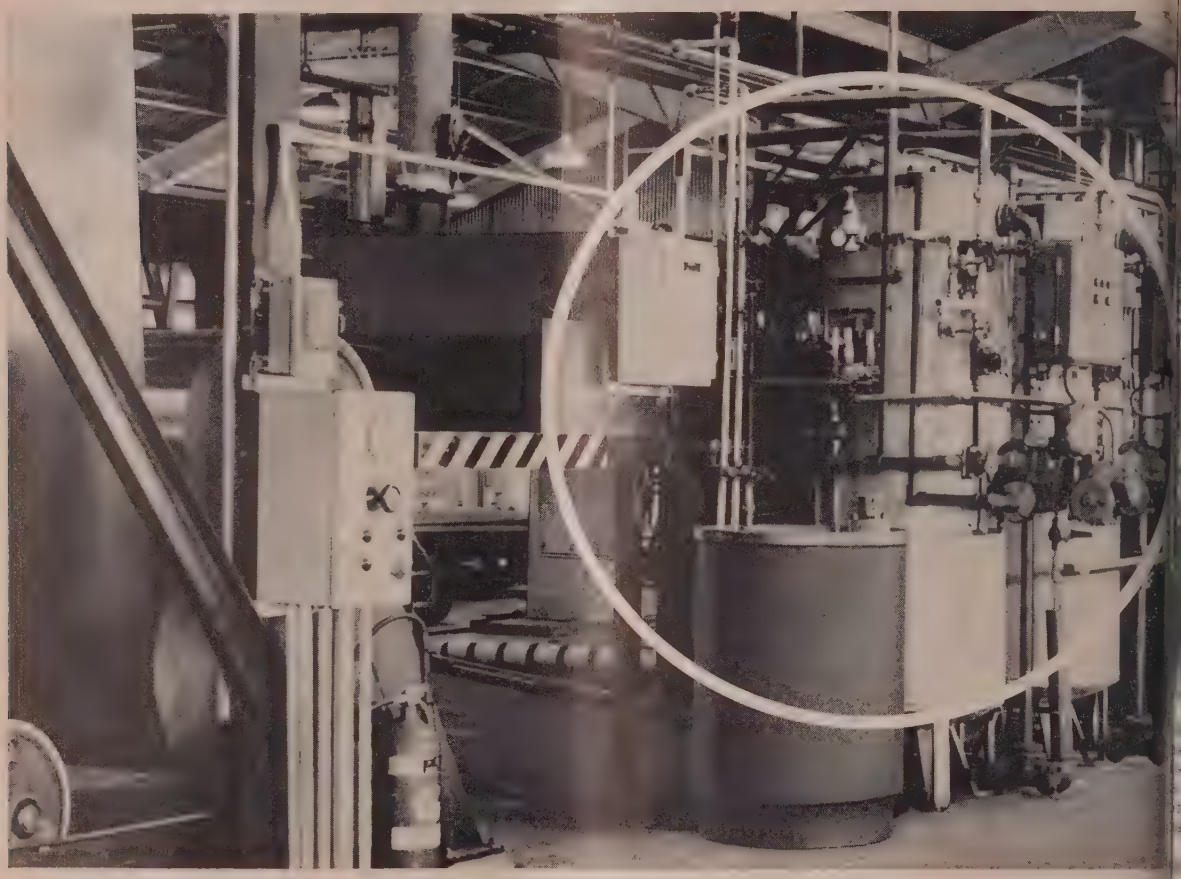
NOW! A QUALITY for BONDERITE coating



This quality control center solves a serious production problem — the build-up of contaminating reaction products in the processing solution on high production strip lines for conversion coatings on aluminum.

It eliminates the formation of sludge and the need to dump the coating bath, ever.

It results in:

(1) Uniform quality
(2) Positive solution control
(3) Reduction in rejects and downtime
(4) Reduction of chemical consumption because the coating bath operates at low concentration
(5) Minimum sewage disposal problem

How Parker Reactifier maintains quality

As aluminum is treated in any conversion coating solution, there's a build-up of reaction products, mainly aluminum and trivalent chromium, in the bath. Continued operation without removal of these impurities means slower coating action, sludge formation, and irregular and inferior coa ings.

The control or removal of the interferi impurities stymied manufacturers for yea until Parker developed the Parker React fier for use with Bonderite in high produ tion aluminum lines.

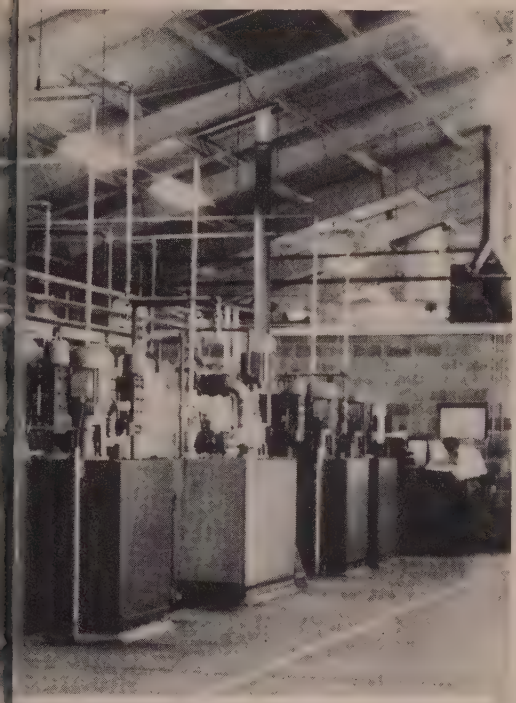
The Parker Reactifier is an ion exchan unit connected in the circulation system the processing solution. As Bonderite flo down through the cation resin bed in t Reactifier, aluminum and chromium are r moved and the purified Bonderite is r turned to maintain the coating bath at t efficiency.

Proven by years of use

One Parker Reactifier has been in continuo use for over three years on a Bonderite hi production aluminum strip line. In all t time there has been no deterioration of t cation resin, no sludge build-up, and reason to discard the bath. This manuf

ONTROL CENTER

high production aluminum strip lines



Bonderite installation at Kaiser Aluminum's swood Works, Ravenswood, West Virginia, s aluminum strip up to 66 inches wide. Tandem Reactifiers remove contaminants from the rite solution as they are formed, keeping coat- ality at a constant high level.

The Parker Reactifier, "Quality Control Center" of Bonderite for aluminum on high production strip lines. Bonderite enters at "A"; resin "B" removes impurities by cation exchange action; purified solution is returned at "C." Regeneration of the unit is accomplished by circulation of acid from tank "D" to cleanse resin of accumulated impurities.

now is installing a second strip line for derizing aluminum with another Parker tifier for quality control.

the comparatively short time Parker tifiers have been available, the largest ufacturing and fabricating plants have installed 30 of them to assure high quality coatings on aluminum.

You'll be proud of the finish on your product when you use Bonderite before painting. It improves paint life five to ten times. Call in the Parker man today!

Bonderites for aluminum meet MIL-C-5541 specifications.

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Here and There

Boon or Bust? « « William L. Stolk, chairman of American Can Co., recently described the fierce competition between aluminum and tinplate as a "boon which will result in improvements in packaging." What he probably meant is that it is certain to slash the price of whatever material Canco chooses to convert into containers. And at the rate the price war is progressing these days, it could contribute to a bust for the already threadbare financial statements of the aluminum producers. When Alcoa lopped 2.7 cents off the price of can stock late last month, it brought the price of the .008-inch sheet perilously close to the price of ingot. The new price — which Reynolds and Kaiser promptly adopted — is 28 cents a pound on orders for 250,000 pounds or more. Ingot, of course, is pegged at 26 cents. Considering the huge amount of processing that's crammed into that 2-cent spread between ingot and coiled sheet, one wonders how the profit, if any, is measured. Conversely, will this provide more ammunition for those who claim that the price of ingot is too high?

Steel Strikes Back « « The Alcoa move looked like a reaction to the announcement that a major can maker would trim the price of cans made of thin tin to $18.63 per thousand — about $1.80 below the tag on aluminum cans with tinplate ends. Thin tinplate is the steel industry's answer to aluminum's invasion of the market for cans for citrus concentrates. Aluminum officials claim they grabbed half of the business, estimated at 1.4 to 1.5 billion 6-ounce cans, in the 1960-61 season; think they'll take 80% of the market for some 1.7 billion cans in the coming season. Their colleagues in the steel industry dispute both estimates; are banking on thin tin to restore steel's dominance of the citrus business and consolidate tinplate's position in still bigger markets such as cans for beer and vegetables. Can makers, meanwhile, are both delighted by the lower material prices and worried over the trend toward in-plant assembly of cans. If it can be done with aluminum in citrus packing plants, it can be done with thin tin in plants that pack everything from beer to tomato soup. So maybe a price war will start shaping up between can makers.

Bankers' Paradise « « Aluminum has scored an impressive victory in another market that's become a battleground between the two major metals. This one is the curtain wall business, and one of the brightest feathers in aluminum's cap is the sleek skin on Chase Manhattan's sumptuous slab in New York. Glowing serenely amid the somber stone towers of the world's greatest financial center, the new 60-story home of Chase Manhattan is sheathed in 780,000 square feet of aluminum and glass curtain wall panels, fabricated and erected by General Bronze Corp. Elegantly styled aluminum is in evidence throughout this financial temple, but the exterior wall system is an especially significant triumph for the metal. Reason: Both anodized aluminum and stainless steel were compared, side by side, in a mockup of the curtain wall, erected on Long Isla several years ago. Both metals performed well, acco ing to a report in the July issue of *Architectural Foru* "The final decision to use aluminum was made join by the architects (Skidmore, Owings & Merrill) and t client, based partly on their preference for the appe ance of the aluminum finish, partly on comparat cost, and partly on the longer-than-usual guaran which was offered by the aluminum producers," magazine reported. The wall panel consists of a 4-fo 7-inch high aluminum spandrel and sill assembly a an 8-foot high clear glass window. The sill panel black anodized with matte finish. Natural finish alu num is also matte texture. Five extruded aluminu mullions sub-divide each bay. Wall panels are recess within the structural columns of the building, wh are also sheathed with ¼-inch thick aluminum.

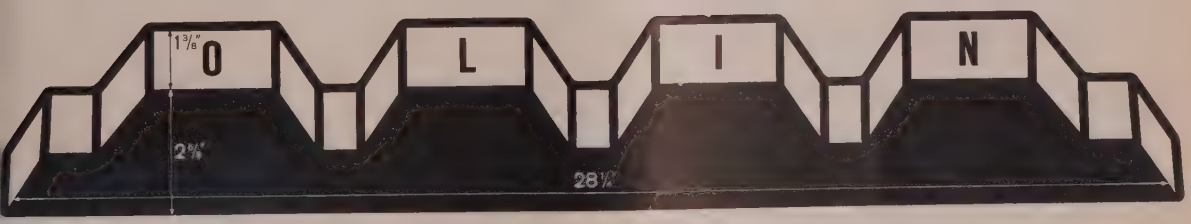
Bumpers? Wheels? Axles? « « While the has over aluminum bumpers continues to simmer, a while Kaiser Aluminum labors mightily to put its a minum wheels on at least one production car, Al is quietly going out after the axle housing market. mor has it that a die cast housing is now under de opment; that Alcoa hopes to have prototypes rea for evaluation later this year; and that the aim is sell the housing to at least one auto maker for the 19 model year. Main obstacle at present is said to be c but aluminum surmounted this one in the eng block; presumably can repeat in this applicatio which would account for a substantial tonnage metal.

Wanted: Extrusion Ideas « « Now's the time cash in on that extrusion design idea you've been m ing over so long. Back between pages 62 and 63 of t issue you'll find an entry blank for Kaiser Aluminu new extrusion design contest. Purpose of this comp tion is to stimulate new uses for aluminum extrusi — an endeavor we heartily endorse, in view of the g of extrusion capacity that has kept an important s ment of the aluminum industry in turmoil lo! th many years. If you come up with the winner, yo rake in three-thousand bucks — which would proba be a fair profit margin for the average independ extruder these days. Kaiser is putting up $2500 for f prize, and Rogers Industries, Inc., an independent truder in Detroit, is adding a $500 bonus. Rogers also add $250 to the $1000 second prize and $50 e to the five $100 awards. So fill in the card and se it to Kaiser Aluminum. Nothing to lose, and ple to gain.

Subway Market: The Best « « If there is area of rail transportation where simple economics c not be ignored it's municipally operated subway s tems. The rapid transit system that shows a fair pr every year is the exception in the U.S. Transit mana ments rarely have supporting line-haul freight lines bail them out of the red. Nor can they cut out tra

0-lb. ingot

5-lb. ingot



0-lb. ingot

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in order to reduce losses. The public must be serve and reacts nastily when it is not—or when fares a raised. The alternative: Economize by cutting operatir and maintenance costs. In this area, the City of Toro to has a growing appreciation for aluminum. J. Lefebure of Aluminum Co. of Canada, Ltd. told th American Transit Association Advisory Committee o Rail Cars last month that Toronto's decision to buy aluminum subway cars was based on ten years' exper ence with both aluminum and steel. The TTC b lieves the new cars, though longer than convention steel models, will offer an appreciable weight savin To evaluate and compare bids, the commission mad an allowance of $3000 per car for cars which require no painting and a dollar per pound for weight save In competitive bidding, the winning aluminum bi combined the lowest cost with the lightest materia

A Call for Unity « « Plastics' rapid developmen coupled with the technological resurgence of wood an concrete, has caused the National Association of Arch tectural Metal Manufacturers to believe that meta could very easily lose the architectural market by d fault unless some effort is made to get the industr moving with greater unity and cooperation. Jack M Roehm, NAAMM's president, said recently that th architectural metal industry will have increased com petition from the masonry, lumber, concrete and pla tics industries in the years ahead. He looks at the we heeled, promotion-minded associations in these variou industries and believes that his industry should "mee the threat with strong, positive action of its own." Th architectural metal industry is represented by too man small trade associations, Roehm said. "The lack c cooperation and unity [among these groups] weaken our efforts and creates confusion in the minds of arch tects, building owners, contractors, metal fabricator and suppliers to our industry," Roehm added. Roehm has called a meeting of representatives of 13 or 14 a sociations of metalworking firms in the architectura field at Chicago's Ambassador East Hotel, August 10t at 9:30 a.m. We hope that all possible representatio will be on hand for the meeting.

Along This Same Line « « The Aluminum Win dow Manufacturers Association and the Sliding Gla Door & Window Institute are merging—a commend ble move that is in the best interests of the windo and door industry, and one that other association should duplicate. The two associations have certainl made a difficult move seem quite simple.

Love That Aluminum Package « « Word earl last month was that Kraft Foods Div'n of Nation Dairy Products Corp. were most enthusiastic about th new aluminum cans used to package five Kraft chee products for nationwide distribution. Kraft believe that the unique design of the cans holding its read to-serve dips will boost sales volume substantially. Th aluminum zip-open can, developed and manufacture by Central States Can Corp., Massillon, Ohio, wa described in detail in Modern Metals last Novembe Equipment to produce the cans was developed by th E. W. Bliss Co., Canton, Ohio, and Kaiser Aluminur

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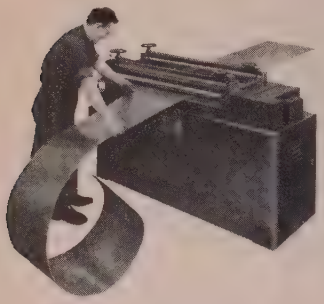

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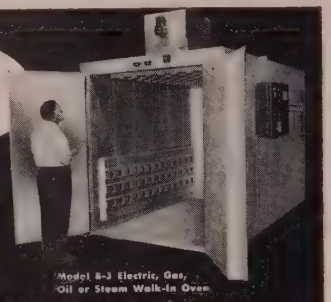

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New Enterprise

Plant expansions, new plant openings, plant sales, and similar maneuvers occurred rapidly in the past several weeks. In the West, Aerojet-General Corp. dedicated its new $1¼ million Astrionics building in Azusa. The **infrared subsystem** for the *Midas* satellite is being manufactured there.

The Altech Division has been created by Financial Development and Research Corp., Parkersburg, W. Va., to manufacture aluminum **office and institutional furniture.** The firm has purchased the furniture manufacturing plant of Ravens-Metal Products Inc. in Elizabeth, W. Va., and will make its products in this facility.

Aluminium Limited has agreed to sell to A/B Svenska Metallverken for about $7 million Alcan's one-half interest in the aluminum **smelting** company, A/B Svenska Aluminiumkompaniet. This will transfer full ownership of the firm to Swedish interests.

Howe Refining Corp., a subsidiary of Howe Sound Co., has begun production of aluminum **additives** at its Sewaren, N. J., plant. The new facility is managed by John Gehrm.

Keystone Distributors Inc. has moved to new quarters at 1710 W. York St., Indianapolis, Ind. The new warehouse has 64,000 square feet of operating space as opposed to 16,000 in the previous location.

Bassick Co., the Bridgeport, Conn., subsidiary of Stewart-Warner Corp., is planning to buy Alcoa's Bridgeport **foundry** and consolidate its division in that town. Alcoa is moving its foundry operations to other facilities and will close the plant soon. The deal is pending acceptance by Bassick's union of a three-year contract; no trouble is expected.

Aluminum Fence Co., Cleveland, has been purchased by Saramar Industries Inc., Youngstown, who is moving the **fence-making** operations to that city. The acquisition has been renamed Aluminum Fence Co. of America.

A new affiliate of Aristo Mfg. Inc., Cincinnati, has purchased the Columbus **extruder,** National Aluminum Extrusion Co. The extrusion press and other facilities have been moved to Cincinnati for operation.

Acorn Aluminum Co. of South El Monte, Calif., was to have started construction of a 7000 sq. ft. **extrusion plant** in Ontario, Calif., in June. Acorn was waiting for the go-ahead from the city's planning commission.

A home specialty products manufacturer, Enterprise Aluminum Products, Wilkes-Barre, Pa., is now producing aluminum **residential siding** in six colors from Reynolds Colorweld coil. Owners J. F. Wardell and

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Every sheet, coil or tubing shipment of Quaker State aluminum is now certified in writing. It's your assurance that ***your*** order has passed our rigid standards of quality control to meet your exacting specifications.

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Although not required by the Aluminum Association Standards, every order to be used in drawing applications undergoes this "cup" test to determine its drawing characteristics. Only after a metal has passed this extra QSM test does it receive the stamp of "Certified Aluminum."

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Peter Klamash say the siding will be distributed through building products dealers and siding applicators in northeastern Pennsylvania.

Dravo Corp., Neville Island, Pittsburgh, Pa., won contract for the construction of a 2200-ton Schloemann oil-hydraulic, self-contained **extrusion press.** Feller Engineering Co., Pittsburgh, U. S. sales agent for Schloemann A. G., awarded the contract. Features of the press include: Integral piercer with arrester gear, remote controlled piercer stroke adjustment, stroke limiting, mandrel turning and relative stroke devices, capability of severing the extrusion in front of or behind the die; fully automatic cycle control with an entirely novel electric control arrangement.

Reynolds Metals Co. has recently installed in their Richmond, Va. plant a rapid **gas furnace,** built by Granco, Inc., Grand Rapids, Mich., for use with a 5000-ton extrusion press. The furnace has five controlled heat zones with all automatic equipment. Granco also supplied the Torrance, Calif. plant of Reynolds with several gas fired rapid gas heaters, together with tape, quench tank, die heaters and aging ovens.

An aluminum **sand, permanent mold and shell molded casting** company called Alumicast has been established by Gale Mfg. Co. of Albion, Mich. Equipment is being purchased and operations are expected to begin this summer. Initial melting capacity will be 960 pounds a day.

Armchairs with legs of tapered aluminum tubing tipped with brass glides and ferrules are being produced by L & B Products Corp., 189 Huguenot St., New Rochelle, N. Y. Arms are polished wood, seat and back foam rubber covered with colored fabric.

Another foreign **aluminum production plant** will be constructed shortly at Steg, Switzerland by Aluminium Industrie Aktiengesellschaft. At the same time the firm will construct an aluminum strip rolling mill.

A 2200-ton self-contained oil hydraulic aluminum **extrusion press** is being built under a $366,000 contract with the Pax Metal Corp., Van Nuys, Calif., by Baldwin-Lima-Hamilton Corp.'s Industrial Equipment Div'n, Eddystone, Pa. The unit will handle 9-inch diameter billets 30 inches long; will be delivered this month.

An Adrian, Mich., **extrusion** plant with an unenviable record of business failures, is now the property of Harvey Aluminum Co. of Torrance, Calif. A variety of products including extrusions will be manufactured at the facility. The purchase of this plant for $3,626,10 from the government marks Harvey's first move east. The government was anxious to find a buyer who would be able to begin operations almost immediately, and use up some of the out-of-work labor force in this depressed area. It is expected that if operations ever reach maximum capacity, some 2500 workers would be needed.

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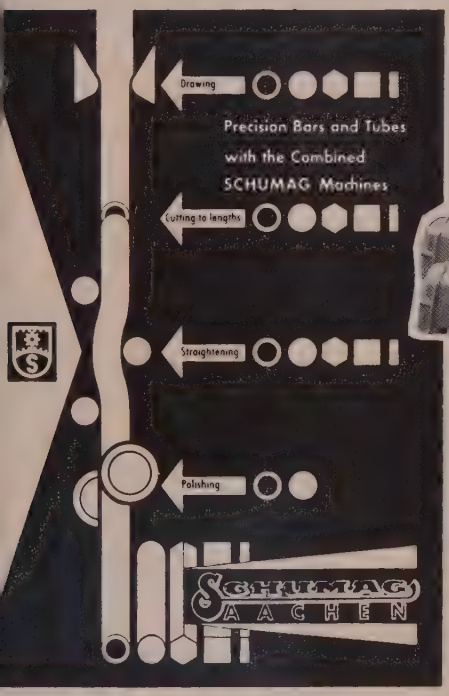

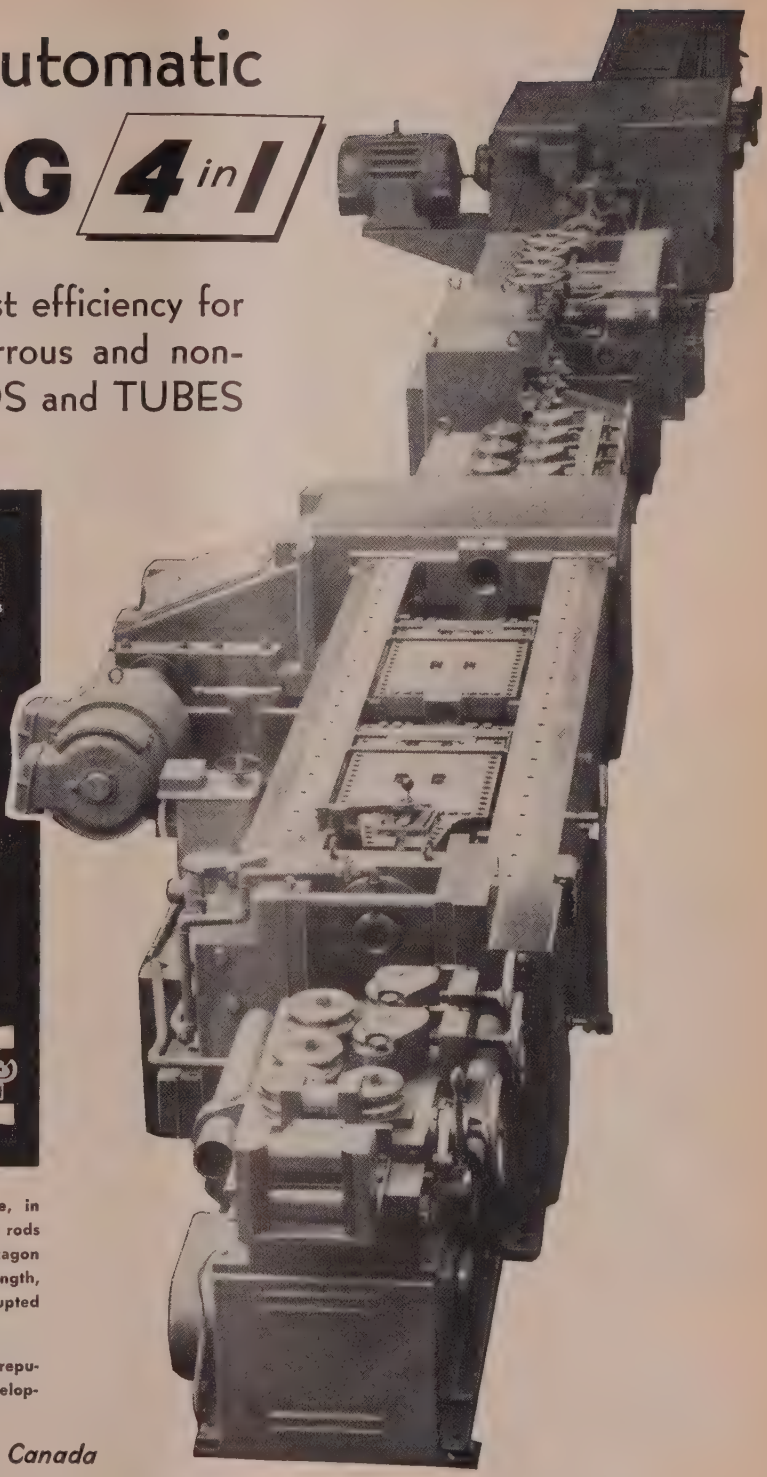

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Useful Data

High purity aluminum, and aluminum sheet and foil, as produced by Consolidated Aluminum Corp., Jackson, Tenn., are described in a new presentation piece. Many photos, some of which are in full color, dramatically describe the firm's operations, from slab casting through foil rolling. In another shot, the company's 26 refining cells for the production of super purity aluminum are shown. Consolidated Aluminum's technical service capability is also described. T. W. Allison will send this on request.

Power screw drivers, impact wrenches, hammers and many other types of power tools — hand and pedestal — are described and pictured in a new catalog of Black & Decker Mfg. Co., 695 Pennsylvania Ave., Towson 4, Md. In all, 23 product categories are covered in this 52-page booklet. Send your request to Harvey Porter in Towson.

Porcelain enameled aluminum is the subject of a new 6-page supplement to "Lead in the Ceramic Industries," recently published by the Lead Industries Association. The supplement is designed to give the potential producer of porcelain enameled aluminum products information on what these enamels are and what they will do. A growing list of applications is also given and the special advantages of aluminum with a porcelain enamel finish are cited. Write to S. W. Turner care of the Association at 292 Madison Ave., New York 17.

The line of industrial finishing equipment made by Burdett Mfg. Co. is discussed in a collection of data sheets and a brochure prepared by this company. Covered are air make-up units, ovens, furnaces, spray booths and washers. Radiant heat combustion principle used in Burdett ovens and furnaces is explained. Ask Al Hurley for this material at 4920 S. Monitor Ave., Chicago 38.

Aluminum window fittings are described in a new illustrated bulletin of Gries Reproducer Corp., 125 Beechwood Ave., New Rochelle, N. Y. Eight basic types of die cast fittings are listed and illustrated. The advertising manager will send this.

"Process Chemicals for the Finishing Industry" is a collection of reprints of articles written by metal finishing experts of Allied Research Products, Inc., and technical data charts presenting the facts about the Iridite line of chromate conversion coatings. The complete Iridite line includes many different finishes for steel, aluminum and many other nonferrous metals. Irilac coatings, compounds of water-soluble resins and corrosion inhibitors designed to protect all metals, are also detailed. Write to Frank Mansfield at 4004 E. Monument St., Baltimore 5, Md. for this file.

Heat processing equipment designed and built by The Lanly Co., 2800 Euclid Ave., Cleveland 15, are

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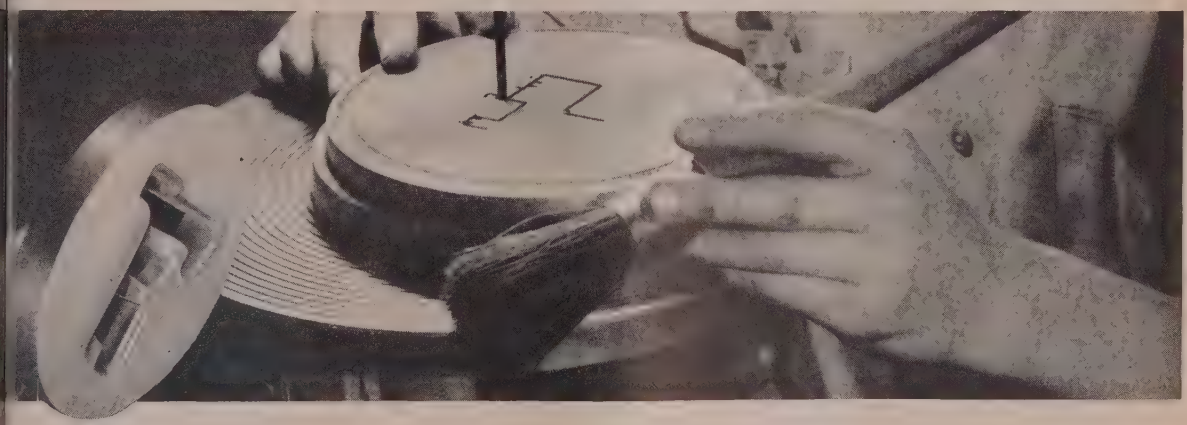

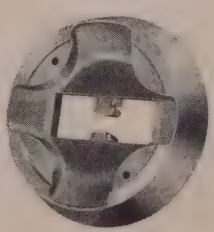

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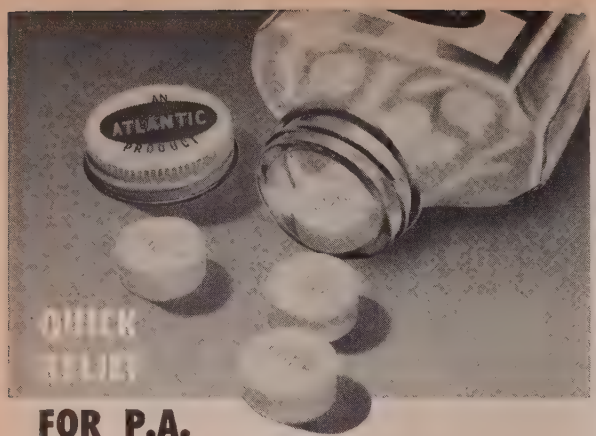

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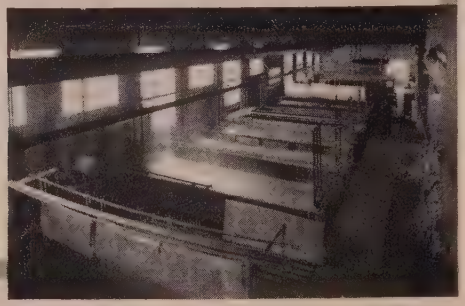

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described by means of case histories in various fields of industry — finished drying, light metal treating, heavy clay products, mold conditioning, refractory drying, paint baking and others. The types of Lanly equipment used in all these industries are presented in photos and diagrams. Write to James Lyle for this booklet.

Diversey No. 519, a new spray cleaner developed by The Diversey Corp., 212 W. Monroe St., Chicago 6, is described in a new bulletin. The company reports that No. 519 is designed for quick soil penetration, complete emulsification and dispersion, and free rinsing and draining. The bulletin also includes a description of Diverfos F-72, used to apply a thin, uniform iron phosphate coating following the No. 519 rinse. H. M. Gill will send this folder.

Dry film lubricants are the subject of a 12-page brochure prepared by Everlube Corp., 6940 Farmdale Ave., North Hollywood, Calif. Included in the data are a lengthy definition of Everlube, a case history describing one of the Everlube formulations applied to airliners' landing gear, application methods, and descriptions of four different compounds. Ask the advertising manager for this.

Aluminum and steel tubing, square, rectangular and round, hollow bar and fittings are cataloged in a new booklet put out by C. A. Roberts Co., 2401 25th Street, Franklin Park, Ill. The 22-page catalog also lists names of 10 resident salesmen in nine cities in the west and midwest, besides listing the names of 27 inside salesmen handling phone calls at Franklin Park, Milwaukee, Detroit, Indianapolis, Kansas City, Mo., St. Louis, St. Paul, and Tulsa. Write to Sam Hibben for this catalog.

Contact wheels and industrial rolls — and how to select and use them are treated in Catalog CWIR 760, recently published by Chicago Rubber Co., Inc., 651 Market St., Waukegan, Ill. The booklet shows how rubber densities are varied for different grinding jobs. Charts are used to explain the behavior of plain and serrated rubber contact wheels.

Kux die casting machines are fully described in a 30-page data book prepared by the company. It gives specifications of the various sizes and models of machines available to both "make to order" jobbers and captive plants. Most of Kux's 28 new machines are illustrated. R. B. Kaufman, Kux Machine Co., 6725 N. Ridge Ave., Chicago, Ill., will send the booklet.

Cold formed shapes, as produced to order by the Coldform Div'n of H. K. Porter Co., Inc., are described in a new booklet prepared by that division. The 20-page booklet describes the various cold forming methods: Roll forming, stretch bending and stamping. Also given are case histories of metalworking problems solved by the various cold forming techniques. The booklet also selects some of the nation's leading industries and shows where one or the other of the techniques comes into play product-wise. Write the sales manager at the Coldform Div'n, Detroit 34, Mich.

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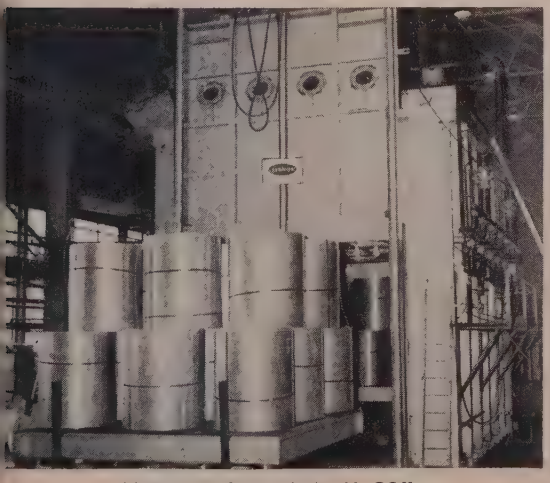

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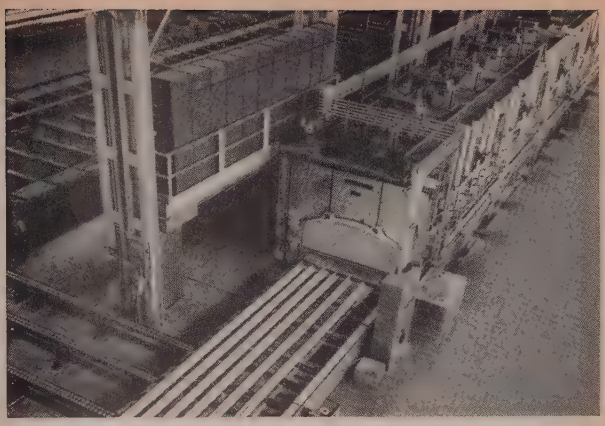

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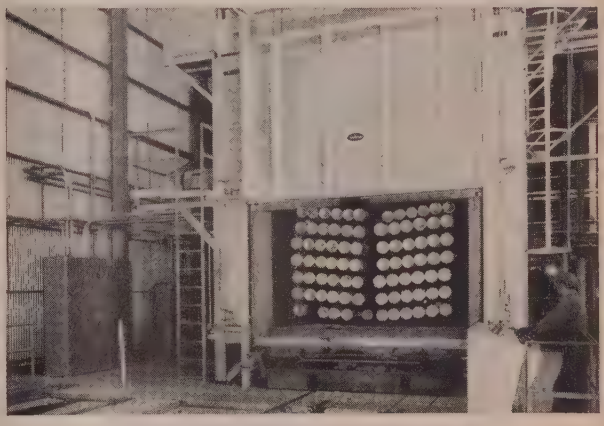

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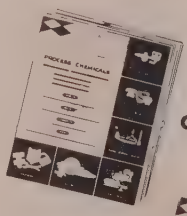

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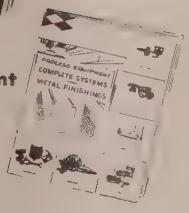

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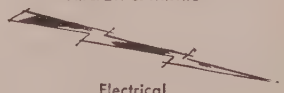
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EXTRUDERS — expect to use 20% more aluminum this year than last; see no improvement in prices; look for good or fair business for second half; plan to expand, modernize.

EXTRUSION USERS — expect to buy 15.4% more this year; report on number of suppliers, price cut offers, new extrusion uses, plans for own presses; offer advice to extruders.

EQUIPMENT FIRMS —report slight rise in orders, good export sales; see no trend to leasing; consider many plants obsolete.

by F. L. Church, Senior Editor

ACCORDING to U. S. Department of Commerce statistics, shipments of uminum extrusions in the first four onths of this year were nearly 3.5% wer than the same period last year. he actual figures are 139,280 tons for nuary through April of 1960; 134,585 ns for this year's like period.

On the other hand, replies to a Mod- n Metals survey of extrusions plants ould seem to indicate that an appre- able increase in extrusion output is in ie offing this year; and replies to a milar survey of extrusion users—prod- ct manufacturers that buy extrusions— pear to substantiate the extruders' redictions of increased volume in 1961.

This apparent contradiction between overnment statistics and Modern Metals survey results could lead to vari- us conclusions. Perhaps the extruders nd extrusion users who did not reply o Modern Metals' surveys are the ones whose business is off. And maybe those ho did reply are over-optimistic.

May, June to Tell the Story

But most important is the trend of xtrusion shipments in May and June. hese are traditionally good months for ne extrusion industry, and we believe hat shipments in May topped the April evel by some 15%. That would bring he month's total to about 40,500 tons.

And if June shipments increase 10%, t would bring the first half total to ome 219,500 tons, or about 2% higher han the first half of 1960 — despite the ndustry's dismal showing in January nd February.

Finally, Modern Metals' survey ques- ionnaires asked extruders and users to ase their predictions on the outlook or the second half of the year. Evident- y, the majority of those who replied xpect business to pick up through the est of this year.

Replies to Modern Metals' extruders questionnaire were received from 47 ex- truders, and 43 of them reported the mounts of aluminum they consumed ast year and the amounts they expect to use this year. Adding them up, we find that these 43 firms extruded 126,016 tons of aluminum in 1960 — or 29.6% of the 424,994 tons of extrusions shipped, as reported by the U. S. Department of Commerce.

If the predictions of these 43 firms prove accurate, they will consume 151,- 550 tons of aluminum this year. This would amount to a 20% increase. If the same percentage increase were applied to the industry as a whole, aluminum extrusion output in 1961 would total nearly 510,000 tons, or some 4% higher than the record 489,610 tons in 1959.

Second Best Year In Offing

We are not suggesting that anything of the sort will actually happen. Many knowledgeable observers, both in and outside the industry, would consider a 15% increase too optimistic.

Still, we will clamber out on a precarious limb, and predict that in 1961 the extrusion industry will turn in its second best year, with output approximating 466,000 tons. (Incidentally, none of these figures include extruded and drawn tube, which is now reported separately by the Commerce Department. Shipments of tube are generally equal to about 8-9% of extrusion shipments.)

Not all of the respondents expect to use more aluminum this year than last; three predicted declines, and one of these said that his extrusion plant is being shut down. He extruded only 250 tons last year, however. Ten of the 43 extruders who reported tonnages expect to consume the same amount of aluminum this year as last, while 30 (nearly 70%) expect their usage to rise.

These results are closely paralleled by replies to our question regarding business volume expected this year. Higher volume was predicted by 27 firms; 13 expect their volume to be the same as last year; 6 think their volume will decline; one did not answer the question.

When asked how the extrusion business was shaping up for the last half of the year, a dozen extruders said "excellent," 23 said "good," and 11 said "fair." Only one considered the extrusion outlook "lousy."

Prices Weak; Expansion Planned

But the price picture is radically different. Asked if extrusion prices had improved in the past year, 39 extruders said "No." Only four thought that prices had firmed up, and two of them tempered their replies with "slightly." Four extruders didn't bother to answer.

On the other hand, expansion or modernization plans were reported by nearly half (23) of the 47 extruders who returned the questionnaire. Eight of them did not specify the nature of their expansion or modernization, but five said they were installing new presses; four are putting in fabricating equipment; and three will install testing or quality control apparatus.

Two extruders said they are augmenting their finishing departments; two will modernize their handling equipment; and two are putting in melting and billet casting equipment. A new billet heater will be installed by one extruder; a new homogenizing furnace by another.

Asked if they had found any new applications for extrusions, 36 said "No," while ten said they had. The new uses included air filters, window frames for wood sash, transmission towers, raised flooring, new curtain walls, and electronic equipment. One extruder said he had obtained new business from "various items in furniture, autos and hardware that have been switched to aluminum."

Our final question asked: "What's the industry's worst problem, and how would you solve it?"

As expected, the majority (26) cited "prices," "price cutting," "price deterioration," and the like. Only six extruders mentioned over-capacity, while four offered other answers such as: "Immaturity"; or "Suppliers trying to

be competitors"; or "Shapes requiring special tolerances and handling are being quoted at regular prices"; or "Some extruders are able to buy (metal) at better prices than others."

'Take Margin Out of Pig'

Expanding on this last remark, our informant observed that if some of the margin were taken out of pig "each operation would have to stand on its own. Everyone would buy pig and billet at the same price and their success or failure would depend upon their efficiency of operation and ability to sell . . . "

The man who complained about special tolerance shapes being sold at regular prices also declared: "Even in the face of wage increases coming up in August, the 'big three' are still lowering prices on various aluminum items. In many instances they extrude the hard alloys at or below regular 6063 prices . . . "

An east coast extruder who is worried about over-capacity of the industry also sees danger in "merging of primes w captives." A New Englander offered t solution to the capacity problem: "Sh three-quarters of them." A less drama solution—"Develop new products"—v suggested by an extruder in Penn vania.

Another New Englander voiced familiar complaint: "They (primary p ducers) drive the price down by sul dizing extrusion operations from profits. Solution is to have Justice partment *require* a profit on *each* ope tion . . . "

An extruder in Ohio accused the dustry as a whole of "Lack of guts stand up for a fair price. Too eager business just to keep 100% of ope tion."

An easterner saw the main proble as: "Selling below cost, and extension unwarranted credit." As a cure, he s gested: "Educate your salesmen and users."

Finally, a well-known extruder Pennsylvania cited these three princi problems:

"Profits extremely depressed. Ma items priced by primes at impossi levels. Some independents don't look their costs until the sheriff walks in."

Users See 15% Increase

But the extruder's view of his ind try is necessarily limited by his o problems. In order to get a differ perspective of the extrusion busine we sent another survey questionnaire some 2000 product manufacturers, tak at random from Modern Metals' circu tion files.

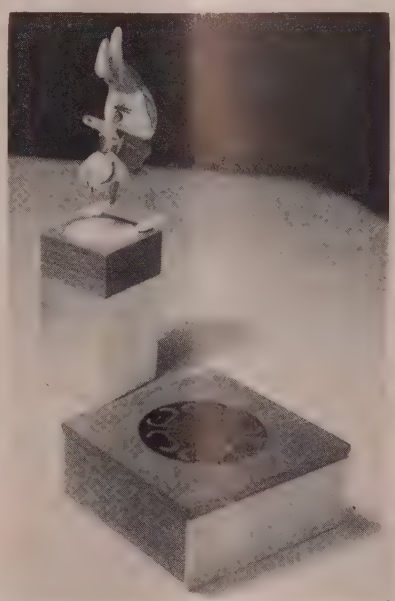
The response has been pretty good some 382 replies, 277 of them fr companies that said they buy alumin extrusions. The 105 firms that do buy extrusions included six compan that produce their own shapes. We d not count their replies in the followi summary because this was intended a survey of product manufacturers w *buy* extrusions.

Of the 277 respondents who buy trusions, only 38 did not divulge t amounts they used last year and exp to use this year. Adding up the repli of the 239 who did provide this inform tion we find that altogether they co sumed 33,043 tons of aluminum extr sions in 1960, and expect to use 38,1 tons this year.

This would amount to a 15.4% crease, which seems more realistic th the 20% increase indicated by repli to the extruders questionnaire.

Products manufactured by these co panies range all the way from awnin to police equipment, from aircraft skis, from windows to flour mill equ ment.

As expected, the largest single gro



Extrusions Help Designers Win Alcoa Awards

Extrusions helped George Beck and the team of Don McNab and Howard Savage win top honors in the third annual Alcoa Industrial Design Awards Competition.

Beck is industrial design manager, Light Military Electronics Dept., General Electric Co., Utica, N. Y. His winning design was for a missile computer test set (above, left).

He used aluminum extrusions and sheet to create a system of shelves which hold boards in a vertical bookcase-like frame. The enclosure is 79 inches high, 25 inches deep and 30 inches wide.

The main structural frame is made of welded 5-inch by 2-inch extruded aluminum channels which support a hinged bay and protect the exterior connectors. The base is formed from 2 by 3-inch box-section extrusions; front and rear bevels are formed of 2 by 2 by ¼-inch angle extrusions. Circuit board shelves, computer cladding, and control panel are of aluminum sheet.

McNab and Savage combined extrusions with walnut and teak to create a line of office and home containers (right) for cigarettes, cards, etc., to blend the advantages of high production with the appearance of hand craftsmanship.

All products in the new line employ standard aluminum extrusions as the body and some use sections as decorative inlay in hardwood tops. Wood bottoms or sides, depending on design, are attached to the extruded bodies with adhesives or by swaging. The structural aluminum elements have a clear anodized satin finish, while decorative inlay tops are natural aluminum set in a color insert panel.

Savage and McNab are members of the design firm of Savage-McNab-Wilson and Associates, Long Beach, Calif. The decorative containers are made by Geometrics Inc. for Peter Pepper Products Inc., Palos Verdes Estates, Calif.

Each winning designer will receive a sculptured aluminum stabile and will be featured in full-color ads in national magazines.

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(57 firms) included manufacturers of windows, storm windows and doors and curtain walls. These companies used 15,427 tons of aluminum extrusions last year; expect to buy 18,283 tons in 1961.

The next largest group of manufacturers includes makers of awnings, screens and blinds (21 plants), followed by architectural and ornamental fabricators (20 plants); aircraft and aircraft parts (11 plants); boats and ships (10 plants); trucks and trailers (9 plants); appliances (9 plants); ladders and scaffolds (8 plants); shower doors and tub enclosures (7 plants); electrical and electronic equipment (7 plants); and storefronts and entrances (6 plants).

The rest make products such as furniture, greenhouses, heaters, nameplates, carts, trim, railings, TV stands, cabinets, grilles, lighting fixtures, camp trailers, portable rooms, structural I-beams, lab instruments, and others.

Answers to the question, "How many extrusion sources do you buy from?" revealed that 67 of the respondents get their shapes from only one source; 83 patronize two extruders; 70 buy from three sources; and 28 buy from four suppliers. The others spread their extrusion purchases among more than four — and as many as ten — extruders.

Price Cuts Offered to 93

The next question asked: "How many extruders have offered to cut prices to you? By how much?" Surprisingly enough only 93 firms, about a third of all replies, reported price cutting offers. (A few said, in effect, "I wish they would.") The actual amounts of the price cuts are difficult to analyze. Some reported in percentage (all the way from 2% to 33%); some in cents per pound (from ½ to 10 cents); and many informed us that it was confidential information. The majority of the replies were in the range of 5 to 10% or 2 to 6 cents.

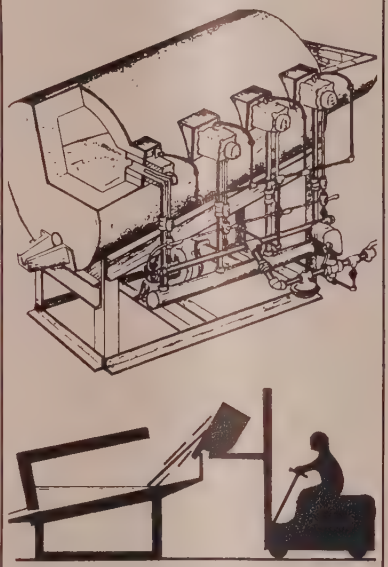
About one-third of the manufacturers (93 in all) reported that they are planning new uses for extrusions, and nearly all of them indicated the products they had in mind. In most cases, the new uses will be in products similar to the ones already made. (Example: A ladder maker plans to bring out a new line of extension ladders.)

But there was some evidence of new product lines in the offing. A manufacturer of carts and cabinets will use extrusions in making hospital beds. A firm that makes solar screens will introduce a line of soft drink displays. A builder of food handling equipment is bringing out a new line of hot and cold cabinets. An awning maker will start producing windows, railings, and columns.

A firm that manufactures shower and tub enclosures will augment its product line with carports, utility rooms and a new privacy fence. Another shower door maker has cabinets and furniture in mind. An appliance maker will use extrusions in the outer frame of a new dishwasher. A supplier of railings is getting into the bakery equipment business. And a company that specializes in blackboards plans to introduce a new line of ceiling partitions.

Seven Plan Own Presses

Seven companies answered "yes" to the question: "Planning to install your own extrusion plant?" Asked why they intend to make their own extrusions, they gave such answers as: "Extrusions priced too high"; or "to reduce costs"; or "our volume is up."



Melts Extruders' Scrap

An aluminum scrap melting furnace for the extrusion industry eliminates space-taking scrap piles by converting scrap into pigs which are easy to handle and store in limited areas. Builder is Carl-Mayer Corp., Cleveland 16.

The circular-tilt, open end furnace permits continuous charging by means of a self-dumping hopper attached to a lift truck, and allows complete removal of metal.

Four low pressure, nozzle-mix gas burners fire tangentially along the furnace length to provide uniform heating. Spark ignited gas pilots provide automatic ignition. Temperature controls and safety features are incorporated.

The furnace comes as a unit; need only be connected to the extruder's fuel and electrical facilities for use. It holds 2000 pounds of molten aluminum.

One of these prospective extrude expects to buy only 150 tons of extru ions this year; another uses 300 ton a window maker in California uses 4 tons; and a storefront producer thin he will buy 500 tons this year. Th others purchase well over a thousa tons of extrusions annually.

A California company that consum 50 tons of extrusions in making portal rooms said "wish I could" install press. His reason: "Maybe get rich?"

Interesting reasons for *not* installi extrusion presses were given by sor respondents. "Not interested in vertic integration," said a storm window ou fit. "Satisfied with shopping for th best," explained a maker of slidi doors. "Don't feel that we could produ as cheaply as we buy without comple smelting operation," said a windo maker in the east.

"Need our capital to develop and i prove the ideas we have," was the log cal reason offered by a concern th presently makes windows and doors a is planning a line of mailboxes a weatherstripping. Most respondents sai in effect, that their volume would n justify the investment in a press.

How Can Extruders Help?

Extruders may be most interested the answers to the final question: "Ho can extruders make it easier or mo desirable for you to use more extru ions?" (A few of the answers are par phrased on this month's front cover.) rough pattern emerges when the a swers are categorized.

For example, 35 product manufactu ers said, in effect, that extrusions co too much, the implication being th they would use more if the price we lower. Better service and delivery woul encourage 18 of the respondents to u more extrusions, while 30 reported th higher quality, closer tolerances and be ter finishes would help them boost the extrusion purchases.

Twenty manufacturers of a wid range of products asked for engineerin and design assistance from extruder while six thought that technical liter ture and compilations of stock di would help them use more extrusion Five firms requested a better pricin setup for small quantity users; fiv others said there should be better i ventories of standard shapes; and fiv firms urged extruders to "stabili prices."

Four manufacturers would like t have sample shapes to experiment with three thought that there ought to b more standardized shapes; and thre others urged extruders to quit compe ing with their customers.

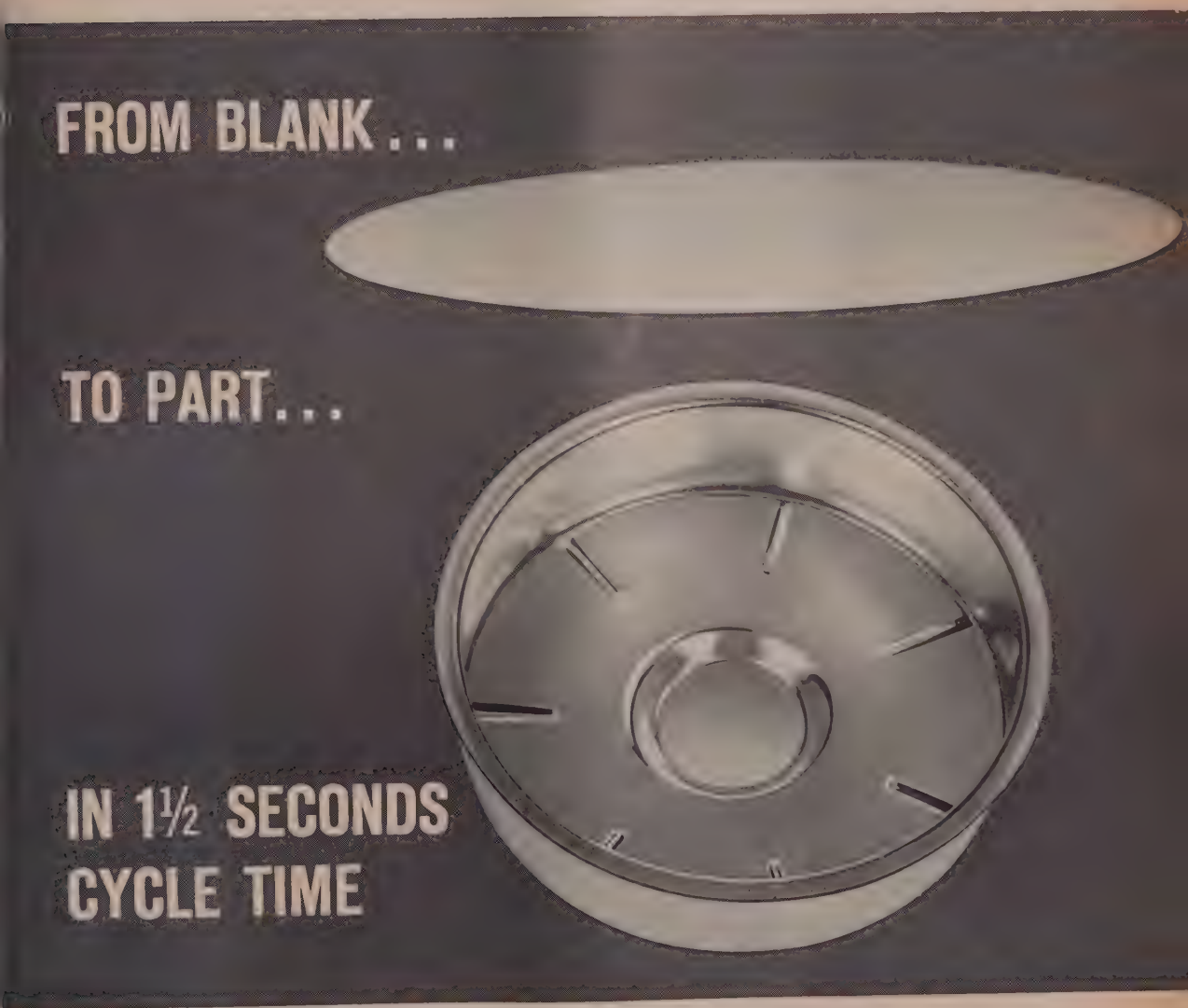
Better credit policies were suggeste by two product manufacturers, while

NEW FAST DRAW TECHNIQUE CUTS FABRICATING COST OF MAGNESIUM

Magnesium parts are now being deep-drawn experimentally at high speeds with a newly-developed process. It uses standard mechanical presses, moderate temperatures (400°F.) and ordinary soap-type lubricants. The part illustrated below was drawn and ejected in 1½ seconds.

This technique cuts the cost of fabricating cylindrical parts of magnesium—with its unparalleled combination of light weight, stiffness and strength. Draws to a 50% reduction are made readily at normal production speeds with a minimum of die stages.

The new technique is expected to find use for many drawn magnesium parts, including components of appliances and business machines. Find out what it can do for you. Write THE DOW METAL PRODUCTS COMPANY, Midland, Mich., Merchandising Dept. 1109CQ7.



DOW THE DOW METAL PRODUCTS COMPANY
Division of The Dow Chemical Company

California concern would be delighted to "have their salesmen sell for me."

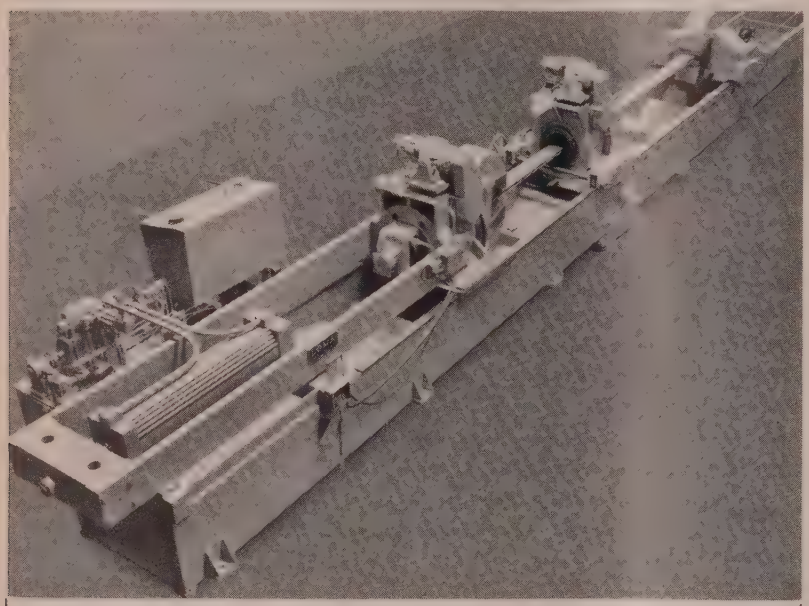
'They Peddle Customers' Ideas'

Several of our informants were more explicit, and a few are worth quoting. A screen manufacturer said extruders should protect their customers' new products. "They peddle ideas of every manufacturer to competitors," he complained. A window maker thought extruders "should not be so free in aiding novice window firms to enter business."

An eastern manufacturer who expects to use 3600 tons of extrusions in storm windows and doors this year would like to have his suppliers "offer extrusions with pre-painted, baked-on colors." He buys from six extruders; does not want to install his own press because "not interested in vertical integration."

An aircraft firm that expects to use 50 tons of hard alloy extrusions this year told us that extruders "should establish more distributors." A furniture firm in the east would like to see "more available sizes in square and rectangular tubing." A window-door maker who expects to use 875 tons of extrusions this year advised extruders to "help choose and develop new products, and create new markets."

Several replies came from firms that are satisfied with their extrusion suppliers. Example: A ladder manufacturer who expects to boost his consumption of aluminum extrusions from 90 tons last year to over 500 tons in 1961. He buys from only one extruder, and informs us that "our source leaves nothing to be desired — fine quality, excellent delivery, competitive price. Why change?"



Helicopter Spars Shaped by Huge Stretcher-Twister

Shaping of a wide range of aircraft spars and similar extruded sections can be precisely controlled with a hydraulic stretching and twisting machine developed by Loma Machine Mfg. Co., Inc., New York 16.

Shown above is a unit used by a helicopter manufacturer to process extruded aluminum alloy rotor spars which range up to 30 feet long. The equipment has a 400,000 pound stretching capacity and a 200,000 pound-inch torque capacity. Stretching speed is infinitely variable up to 25 ipm; twisting is done at ¼ rpm.

The machine has a fabricated steel bed with fully machined ways, an hydraulically movable headstock with twister, a non-rotatable tailstock movable by crank, and a special intermediate steady-rest with closed gripping head and twister.

Gripping jaws are opened and closed by air cylinders. Both the longitudinal headstock travel and the rotary twisting movements are indicated on precise scales and terminated automatically by limit switches.

An intermediate head was developed which is movable along the entire bed so that it can be engaged at any point of the spar. With this device a predetermined portion of the spar can be twisted or detwisted by itself, making it possible to produce two or more different helix angles over an entire length.

Almost all of these 277 extrusio buyers answered the question: "What your business outlook for the balanc of 1961?" The results: More than ha (151) considered the outlook "good while 102 firms see "fair" prospect Only 16 reported a "lousy" outlook fo the balance of the year.

Equipment Firms Report . . .

To complete our examination of th extrusion industry we contacted som equipment manufacturers; asked ther about business here and abroad; if ex truders are operating efficiently or tr ing to get by with obsolete equipmen if they have noted any trend amon extruders toward equipment leasing.

Orders from extruders are pickin up, according to three press manufac turers, a furnace maker and a lubrican producer, while another press firm an a furnace company report that orde are holding steady.

But though sales may be picking u indications are that the pace is ver slow. According to one press manufac turer, "The domestic order situatio isn't likely to improve significantly unti the extrusion market approaches th present extrusion capacity within th country."

However, exports are good, with fou companies noting a definite rise in sale and only one stating that exports wer dropping. (Other respondents are no exporters.)

One firm says it has received a "stron influx of orders for all types of extru sion equipment from Japan, Soutl America, South Africa, India and th United Kingdom." A furnace manufac turer is making shipments "all over th world." Another firm says: "Our expor sales, both of extrusion and straighten ing equipment, are holding up ver well."

Every manufacturer answering sai that a large portion of the extrusion industry is operating with outdated equipment: "30% of it is obsolete," estimates one; "it's about 50-50," claim another.

No Leasing Trend Noted

Only one press manufacturer noted a trend toward the leasing of extrusion plant equipment, while all the other reported no such movement. A furnace builder "noticed such a trend a few years ago," while a press manufacturer pointed out that "leasing charges are not exactly low."

A supplier of auxiliary equipment expanded on this theme: "Unfortunately the extruders who could most use leasing frequently do not qualify on account of their poor financial shape," he pointed out.

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EXTRUSION CLADDING WITH ALUMINUM

Battelle Memorial Institute's metallurgical team describes successful application of the process using aluminum as the cladding, uranium as the core.

By R. J. Fiorentino, C. J. Slunder, and H. J. Wagner

Battelle Memorial Institute, Columbus, Ohio

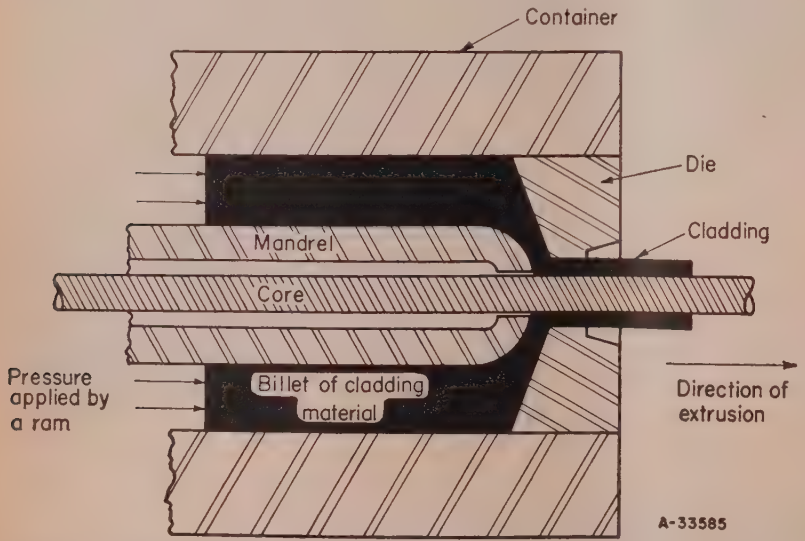
IN THE chemical industry, in nuclear reactors, in the electrical industry, the use of a bimetallic combination is often the best and most economical solution to a problem involving chemical attack, thermal or electrical conductivity, or any combination of properties not satisfied by a single metal. Thus, many examples of dual combinations are available: bimetallic heat exchanger tubes, aluminum-sheathed electrical cables, Zircaloy-clad nuclear fuel elements, etc.

Various ways of making bimetallic articles are known, the choice of a particular process usually depending on economics and the combination of properties desired. Rolling, drawing, electroplating, dipping, coextrusion, casting, and pressure bonding are among the fabricating procedures that have been used to produce bimetallic materials. The process of extrusion cladding is a relatively new technique for producing bimetallic articles. Some of the advantages offered by this process may, for certain applications, outweigh the relative merits of the other techniques.

The well-known sheathing of electrical cable with lead is accomplished by extrusion. In this case, the sheath is merely a relatively loose jacket over a bundle of insulated wires for protection against corrosion and mechanical damage. It is not applied with the intention of achieving a mechanical or metallurgical bond, as might be desired in application involving the cladding of one metal with another. More recently, techniques have been developed to sheath cable with aluminum, rather than lead, to take advantage of the higher strength and lower weight of aluminum. The higher pressures and temperatures required in the latter case have necessitated new tool and press designs, and process changes.

How Extrusion Cladding Differs

Extrusion cladding, as it pertains to the production of bimetallic articles, is similar in principle to cable sheathing, but with the important exception that tools and operating conditions are modified to obtain various degrees of clad-to-core adherence ranging from mechanical to diffusion bonds. All of the advantages generally associated with extrusion, such as economy, high dimensional accuracy, good surface finish, also extend to extrusion cladding. Almost any desired shape of core may be used, and the external configuration of the clad product is limited only by the shape of the extrusion die.



■ *Fig. 1. Principal features of extrusion cladding. Core passes through mandrel and is not deformed. Pressure of the cladding material on the core in the space between die and mandrel promotes bonding; also moves clad core to the right.*

An important characteristic of extrusion cladding is that the bonds between the cladding and the core are developed with little or no deformation of the core material. This aspect distinguishes extrusion cladding from the process of coextrusion. In the latter process, both the core and the cladding are introduced as a bimetallic billet and both are reduced as the billet is extruded through the die.

The basic principles of the extrusion cladding process are embodied in the schematic drawing shown in Figure 1. The core is fed into a hollow mandrel which is fixed in position and axially aligned with the opening in the die. This mandrel prevents the billet of cladding material from contacting the core except in a very small area next to the die. When pressure is applied to the billet, the metal flows around the core and extrudes through the space between the core and the die opening, thereby forming the cladding. In the small region between the mandrel tip and the die face, the cladding metal exerts radial and axial forces on the core. Radial pressure on the core promotes bonding, while axial pressure pulls the core through the die continuously during the extrusion operation.

Among the important variables of the extrusion cladding process are (1) mandrel and die shape, (2) mandrel tip-to-die distance, and (3) temperature. These factors as well as extrusion ratio and extrusion speed influence extrusion pressure. The upper limitation of extrusion pressure is, of course, controlled by the strength of the tool materials at the operating temperature and by the strength of the core material.

As can be seen in Figure 1, the contour of the mandrel tip and die controls the angle at which the metal contacts the core. The selection of optimum mandrel tip and die contours is a complex problem. It depends, for instance, on the strength of the core material, the shape, dimensions, and desired properties of the clad product, and the allowable stress on the tools. Metal flow between a blunt mandrel tip and a flat die will subject the core to much higher radial pressures than will more streamlined tools. The blunt tools, therefore, would not be desirable in

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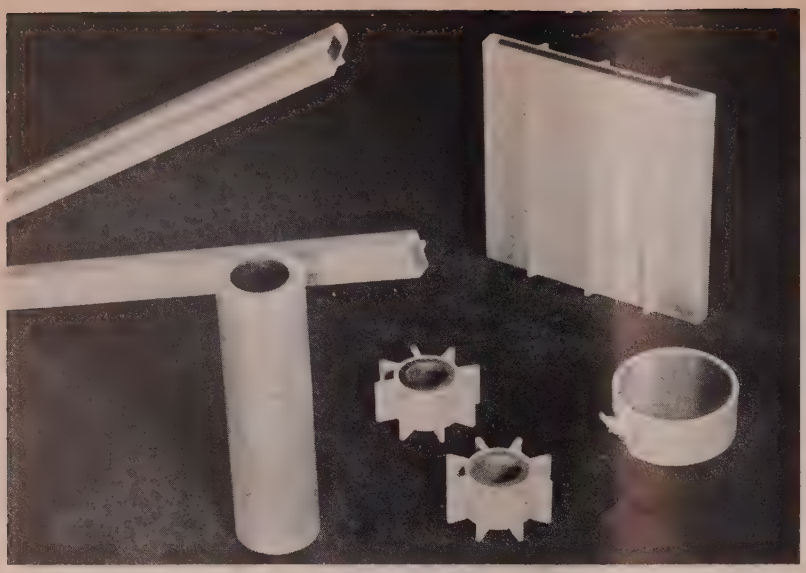


■ *Fig. 2. A few examples of bimetallic components made by extrusion cladding.*

cases where these radial pressures would be quite close to, or exceed, the yield strength of the core material. Although stronger core-to-clad bonds are more likely with the blunt tools, the extrusion pressures would also be greater than with the streamlined designs. Frequently, an optimum intermediate design can be found that will provide adequate bonding and satisfactory operating conditions.

The optimum mandrel tip-to-die distance appears to vary with the contour of the mandrel tip and die and with the clad thickness. At the optimum distance, the core is moved freely through the die by the extruding metal at a speed determined by the ram speed and extrusion ratio. If the mandrel-to-die distance is excessive, the motion of the core is restricted, because it must travel through a greater thickness of metal under pressure as it passes from the mandrel tip to the die face.

The extruding metal, therefore, moves faster than the core and this results in an excessive buildup of metal around the core as it emerges from the die. The cladding then would be greater than the die opening and very likely irregular in contour. On the other hand, a mandrel-to-die distance too small can restrict the metal flow through the die, resulting in a cladding thinner than that allowed by the die opening.

The temperature for extrusion cladding with commercially pure aluminum usually is in the range of 900 to 1000° F. These temperatures are necessary because of the increased pressure required to overcome the tool surface friction encountered in extrusion cladding. At these temperatures extrusion ratios as high as 70 to 1 have been used without difficulty.

Core temperature prior to cladding may also become important if the core is massive with respect to the clad and possesses unfavorable thermal properties. In such a case, the core can drastically chill the metal between the mandrel tip and die, thereby causing an abrupt increase in the extrusion pressure requirements, and possibly resulting in core rupture. This problem can be overcome by preheating the core just before extrusion cladding.

What Can The Process Do?

The extrusion-cladding process was originally developed at Battelle Memorial Institute for the U. S. Atomic Energy Commission. The first application of the method was the manufacture of aluminum-clad uranium fuel plates, about 3 by 3/16 inch in cross section. In this application the requirements of the finished composite product were very rigid, demanding high dimensional accuracy, good surface finish, and metallurgical bonding.

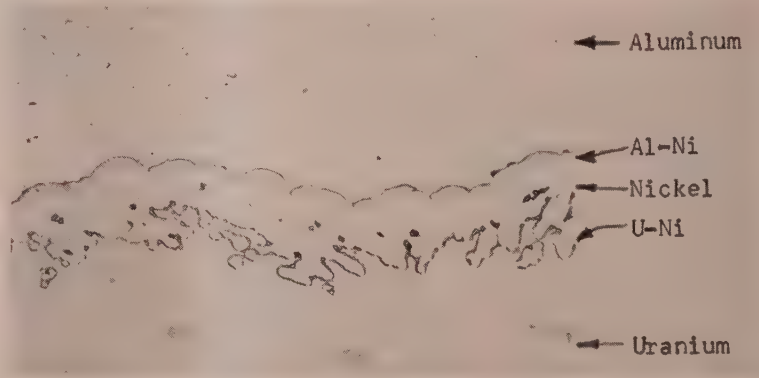
In addition to the flat plates mentioned above, round rods, rectangular bars, and round tubes have also been clad with aluminum by extrusion. Th core materials clad thus far include co per, carbon and stainless steel, an uranium. As in ordinary extrusion, a almost unlimited variety of externa configurations is possible. Figure 2, fo example, shows some of the composit shapes derived from the process.

A photomicrograph illustrating th type of diffusion layers which have bee attained between an aluminum claddin and a nickel-plated uranium core shown in Figure 3. Mechanical tes have shown that these layers represen bonds of excellent quality, often ex ceeding the strength of the aluminum

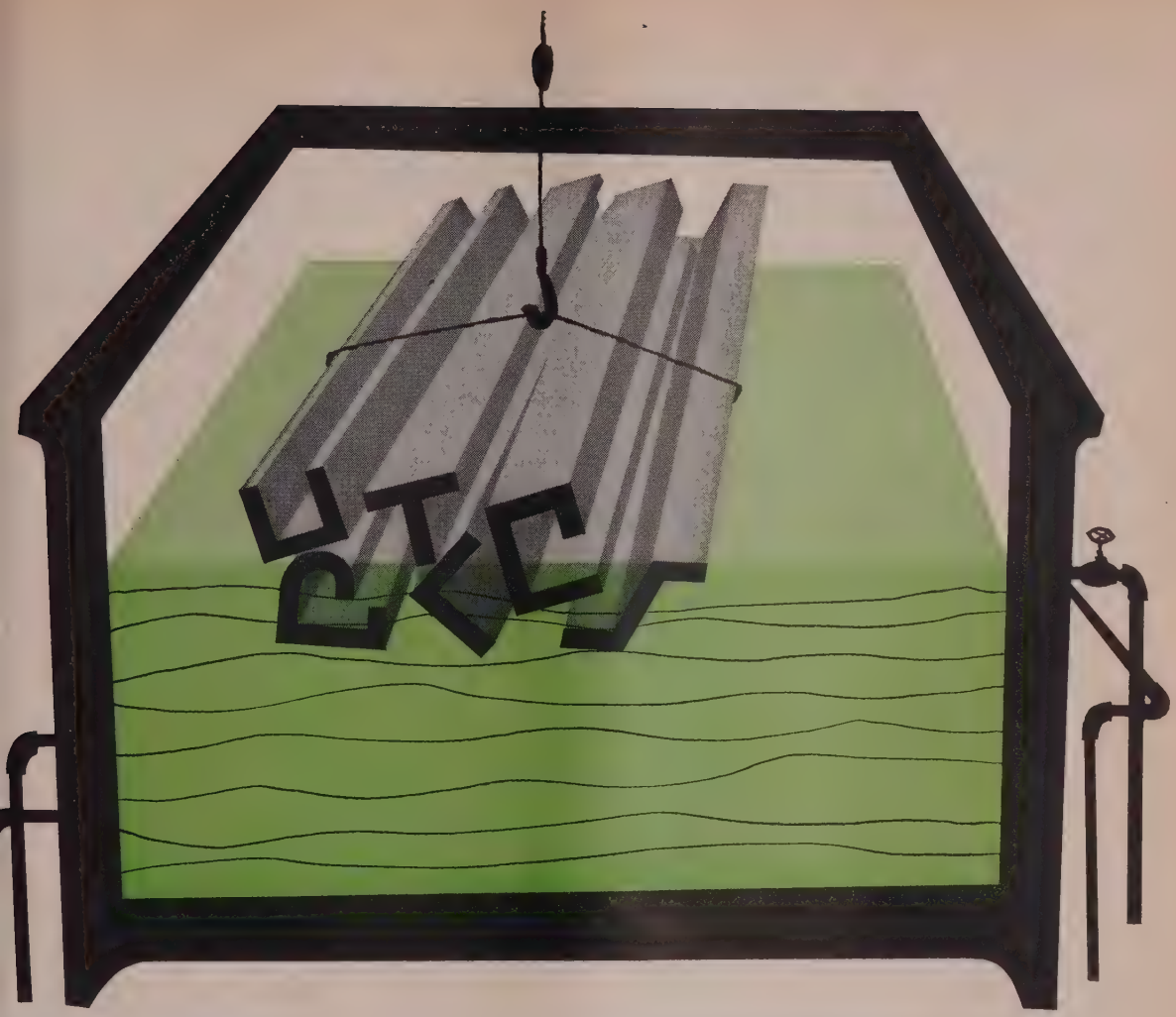
Thus far, it will be noted, only alu minum has been used as the claddin material, although it is believed tha lead, magnesium, or other materials hav ing a low hot-working temperature an good hot formability should not presen any great problems. Almost any cor material may be suitable for cladding even those which might tend to deform somewhat at the temperatures and pres sures used in the process. In such cases however, it would be possible to design tools which would exert only a smal amount of pressure on the core, thu preventing deformation of the core

The most promising area of applica tion of the process, at present is alumi num cladding over a core material con siderably harder than aluminum. Ex amples of products which could be made by this process are those which require aluminum because of its appearance, cor rosion resistance, thermal properties, o perhaps its ability to be anodized, bu require a core of a different material

For instance: copper condenser tube with finned aluminum cladding; steel reinforced aluminum extrusions; alumi num-clad bridge rails or sign posts; ano dized aluminum-clad steel for decora tive applications requiring strength These are just a few of the many possi bilities of the extrusion-cladding proc ess. Thus, only the designer's imagina tion and the tool engineer's ingenuity limit the range of applicability of ex trusion cladding.



■ *Fig. 3. Photomicrograph shows the type of diffusion layers which have been attained between an aluminum cladding and a nickel-plated uranium core.*



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Spray Lubricant Speeds Extrusion Output at Kawneer

Use of 'dag' dispersion 137 reduces lubricating time, prolongs die life, cuts die renovation time, minimizes die pickup, improves surface finish.

VERSATILITY and economy of the extrusion die lubricant used in Kawneer's Mill Products Division, St. Charles, Ill., has helped the plant remain highly competitive in producing aluminum extrusions in a variety of shapes for many customers, each with different requirements.

The St. Charles facility of Kawneer has one 2200-ton and one 1250-ton extrusion press. About 5% of the total production goes to Kawneer's own product fabrication plants. The remainder goes to many midwest firms, practically all with different requirements, who fabricate aluminum for commercial and residential new construction, home improvement products, and industrial applications.

Complying with a variety of customers' rigid specifications regarding finish, yet keeping costs to a minimum, was made possible by using versatile and cost saving equipment and materials. Part of the answer to obtaining fine finishes on extrusions is the type of die lubricant used.

Kawneer's lubrication needs are served by "dag" dispersion 137 by Acheson Colloids Co., Port Huron, Mich. In the 4½ years of operation of the St. Charles plant, this is the only die lubricant that has been used consistently. Other materials have been tried, but only briefly.

Ability of "dag" 137 to cling to the dies and resist heat has enabled Kawneer to get the desired finish, even with the different alloys that are worked. It has also minimized die pickup, which cuts die renovation time, prolongs die life, and permits high extrusion rates. The lubricant is used on all flat dies for a better finish and is a "must" for hollow dies.

Die lubrication has to be quick and easy. To maintain Kawneer's production schedule, application has to be accomplished in a few seconds. Conventional spray equipment is used. The mixture of "dag" 137 and water is drawn from a five gallon pail next to the press through hoses and out a long nozzle on the gun. One quick burst is sufficient to coat the die.

Kawneer pre-heats the dies and billets to an average temperature of 800° F. On the run-out table, the extrusions are stretched and cut to specified length. Loaded on pallets, the extrusions are wheeled into the aging ovens. After cooling and final inspection, the extrusions are ready for shipment.

The use of one versatile extrusion lubricant has helped Kawneer maintain the high standards of quality and production necessary to its business.

■ *One quick burst with long handled spray gun (left) before each "push" is all the lubrication needed at Kawneer's Mill Products plant. Lubricant used is said to reduce time required for die renovation such as polishing (above).*

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ANACONDA ALUMINU

Extrusions Strengthen Aluminum Highway Bridge

New Reynolds aluminum bridge is strong, yet less than one-third the weight of a comparable steel span. Scheduled for service in August, it is price competitive with steel and concrete bridges.

ALUMINUM extrusions and stressed sheet are the main components of a highway bridge which Reynolds Metals Co. hopes will be competitive in initial price with steel and concrete bridges. The first of its type to go into actual use, the bridge is now under construction and will span the Appomattox River between Petersburg and Ettrick, Va. It will replace a steel structure on State Highway 36.

"The Reynolds aluminum bridge has been under development for several years," said W. G. Reynolds, executive vice president for reasearch, "and is a direct outgrowth of industry studies begun in 1957. This design makes aluminum bridges price competitive with any highway bridge available today where beam depth is not a limiting factor."

The bridge is a beefed-up version of an experimental bridge section developed in 1957 and '58 by the leading primary aluminum producers, the Bureau of Public Roads of the U. S. Department of Commerce, and Fairchild Airplane and Engine Corp., Hagerstown, Md., the designer (MM, Sept. '58).

The Longer the Better

The two-lane Petersburg bridge will be 28 feet wide and 97 feet long. Aluminum composite bridges of this type are most economical at relatively shorter lengths and at more than 85 feet, with additional length increasing aluminum's cost advantage over steel, according to Reynolds. Generally, a larger beam depth is required for aluminum than for steel.

■ *A crane swings one of the five aluminum bridge modules into place across the Appomattox River in Virginia. The bridge is designed along aircraft construction principles; will go into service in August.*

Lars Bergenhem, development director of Reynolds bridge projects, said 48,000 pounds of aluminum will be used in the Petersburg bridge, less than one-third the metal weight in a comparable steel structure.

"This weight difference is important in construction," he explained. "For example, the heaviest aluminum components are well within the load limit of a single crane. Steel would require two cranes, and erection of metal components might take two to three times as long. Aluminum's strength-to-weight ratio makes this saving possible."

Forty-five thousand pounds of the aluminum in the bridge is used in the five hollow triangular modules running the length of the span as the main supporting structure. Each of these modules was fabricated prior to shipment by trucks to the construction site.

Another 3000 pounds is used in lateral support extrusions and other items. Fabrication of all components by Globe Iron Construction Co., Norfolk, Va., required about seven weeks.

Looking into the triangle from one end of a module, one sees at the bottom of the "V" a thick extruded beam running the length of the span and weighing 25 pounds per linear foot. At either upper angle of the triangle is a similiar beam that weighs 8.5 pounds per foot.

The skin connecting the extrusions to form the "V," running six feet, nine inches on either wing, is aluminum sheet 1/10-inch thick. Horizontal stiffeners are attached to the outside surface of the sheet and vertical stiffeners inside to give added strength.

Sheet connecting the two upper corners of the module is .040 gauge Reynolds V-beam corrugated, which serves as a carpet for the 7-inch concrete deck to lie directly under crossing vehicles.

Alloy in the bridge is 6061-T6, designed for strength and anti-corrosiveness. This alloy has been approved for structures by the American Society of Civil Engineers. Design of the bridge follows the specifications of this body and the American Association of State Highway Officials.

Aluminum bridge rails and posts also will be used on the structure.

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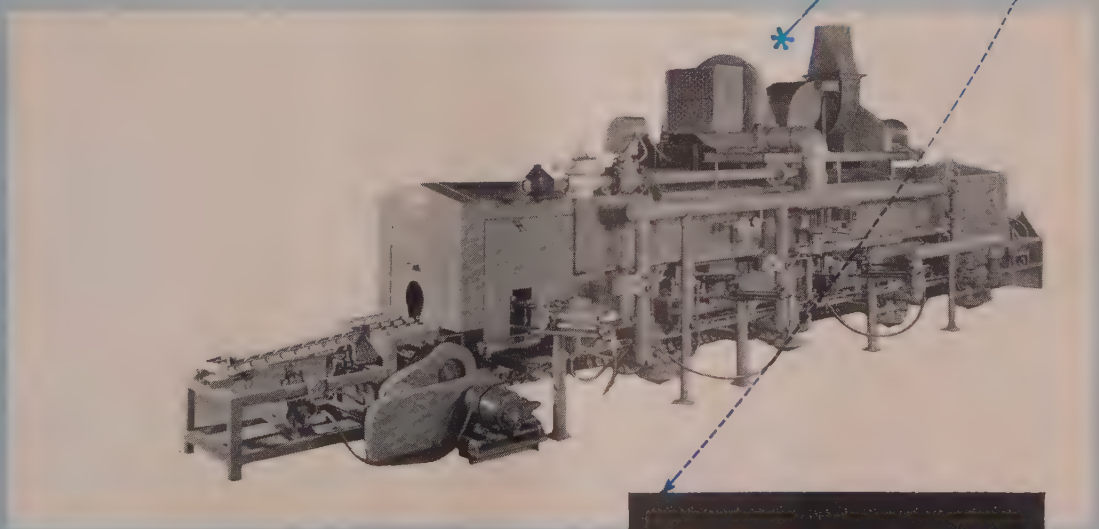

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EQUIPMENT BUILDERS FOR THE EXTRUSION INDUSTRY

SAFETY FIRST

in extrusion plant operations

Safety hazards abound in aluminum extrusion plants — as in virtually all industrial installations. Enormous pressures that power the press create the greatest danger. Operation of auxiliary equipment also involves risks. Tips on how to avoid accidents are given in this article, based on a paper given at the 48th National Safety Congress and Exposition.

by A. M. Murphy, Reynolds Metals Company

THE capacity of an extrusion press is rated by the tons of force it is capable of exerting against the main cylinder. The ram that is affixed to the main cylinder conveys this force or pressure to the metal being extruded. Generally speaking, the higher the tonnage rating of the press, the larger the billet it is capable of extruding.

Most presses in production today vary in capacity from 200 to 14,000 tons. Billet diameters generally range from 3-inch diameter by 10 inches long for the smaller presses to as high as 32-inch diameter by 72 inches long for the largest presses extruding aluminum. The most popular press sizes in operation today are in the 1000 to 3000-ton range, using 5 to 11-inch diameter billets.

According to a recent U. S. Department of Commerce bulletin, there are approximately 360 aluminum extrusion presses in various plants throughout the U. S. This represents about a 70% increase in the last five years.

Two Types of Presses

Engineering-wise, there are two basic means of generating hydraulic pressures for these presses:

1. Presses known as "self-contained" are more compact, less expensive and easier to install. The hydraulic fluid generally is oil; the oil reservoir is usually mounted over the main ram; and the oil pumps are mounted on top of the reservoir. These pumps supply oil pressure to the main ram at approximately 3000 psi.

2. Presses that are not self-contained have a hydraulic accumulator system for their source of power. Water is usually used as the hydraulic fluid. Large pumps force the water into the hydraulic system where it is circulated into extreme high pressure steel bottles, the top of which contain compressed air supplied by a high pressure air compressor. Line pressures of 4500 psi are obtained. Accumulator systems are generally recommended for larger pressures and presses destined to extrude hard alloys. Many hard alloys extrude very slowly. This tends to overheat the oil in a "self-contained" press.

High Pressure Hazards

The main hazard of an extrusion press in operation is the controlling of the tremendous hydraulic pressures contained. Presses using the hydraulic accumulator system are somewhat more dangerous in this respect because of the higher line pressures generated and because of the highly compressed air cushion behind the hydraulic liquid. A stream of hydraulic liquid escaping from such a system can easily penetrate a concrete wall 6 inches thick at a distance of ten feet.

To handle these high pressures, special high strength tubing and welded fittings rated at 5000 psi working pressure are used. Normally, such rated material has a safety factor of 5 to 1 from actual bursting pressures. These high pressure lines are engineered into press construction to reduce harmful vibrations or any other movements which might cause line failures.

In self-contained presses, heat exchangers are used to control temperature of the hydraulic oils. It is important that the oil is held below 130° F to avoid loss in lubricity which endangers valves and other internal moving parts. It is imperative — safety-wise, as well as for production reasons — that all valves function properly when called upon. Hydraulic oils with high flash points are generally used. The main danger of an oil fire occurs when a leak in the system sprays oil on a flame or hot surface.

Today's presses have intricate safety or cut-out valves and switches built into the controls and moving segments. The blocking or cutting out of any one of these many valves or switches will stop the press. The presses are so designed that billet feed-in, die positioning, or any other production movement is done mechanically. No man is ever required to place himself or reach into an area of danger while the press is in operation.

The design of dies and supplemental tooling such as die holder, die back-up, and bolster block, and the positioning of these in the press, are extremely crucial from a safety standpoint. Why is the die area crucial?

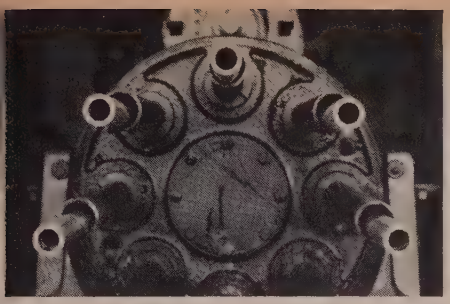
Let us consider a 2300-ton press. It has 4,600,000 pounds of available pressure. If a 9-inch diameter die is used on this press, the die pressure will be 70,000 psi. If an 8-inch diameter die is used, the die pressure will be 85,000 psi. With a 6-inch diameter die, the die pressure will be 145,000 psi.

Proper design with regard to strength of die steel and proper tool assembly and alignment are doubly vital when considering that pressures applied on the tooling in operation will be at temperatures of 600° to 1000° F.

Hard Head No Help

Many of you have seen cartoons or heard about the man who looked into the nozzle of his garden hose to see why the water wasn't coming through — then was squirted in the face. At the extrusion press, you have that same irresistible human curiosity or foolhardiness. Men are strongly tempted to look into the production end or throat of the press to see if the extrusion is coming through the die, even when they know that millions of pounds of pressure are behind that die.

Regardless of how hard or thick man's



Cut Material and Machining Costs

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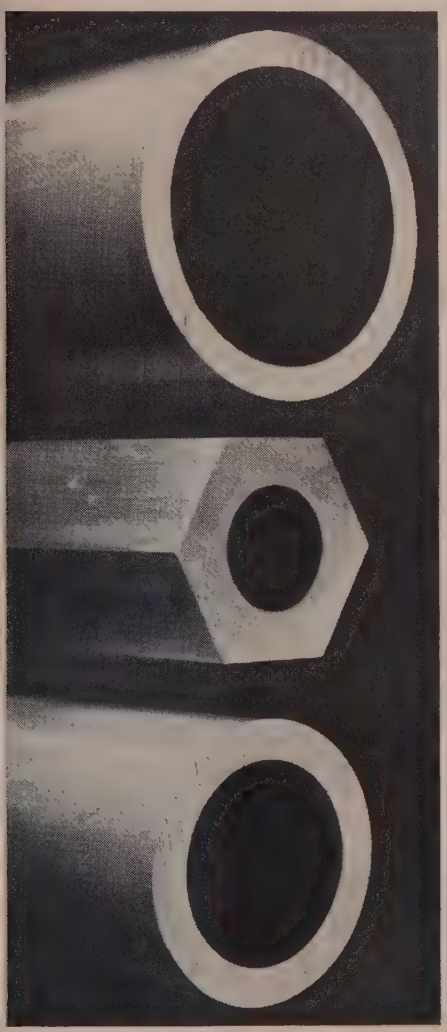

Harvey Aluminum originated and perfected deep-drawn hollow aluminum bar stock to cut costs and to speed production in machining hollow parts.

The hollow bar stock is specially controlled dimensionally and metallurgically to facilitate the high production necessary in today's competitive screw machine market. The costs of both metal and machining are less, the material per foot cost is lower than solid bar because the hole is already there. Chip handling costs are cut. Among other advantages, parts have better dimensional stability; you get the uniform grain structure and other metallurgical benefits of Harvey Aluminum's exclusive deep-drawing process.

Harvey Aluminum deep-drawn hollow bar stock, round or hexagonal, is available in all popular machining alloys. Tooling is available for most sizes from 1″ through 4″ OD, with .188″ to .500″ wall thickness. Many larger and smaller sizes also are produced, subject to mill inquiry. The Harvey Aluminum deep-drawing process cold works both ID and OD. Material meets all government rolled bar specifications for items standard in the screw machine industry.

Harvey Aluminum deep-drawn hollow bar stock is warehoused by highly-qualified metal distributors in principal industrial cities. For further information, call the nearest Harvey Aluminum Sales office listed in the classified pages, or contact Harvey Aluminum, Torrance, California.

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Write for brochure giving complete information on hollow bar stock.

head may be, fragments of the tooling or the extrusion will invariably penetrate it completely as though no obstruction were there, when a break occurs.

Here's a Safety Checklist

To prevent accidents due to tool breakage, the following precautions are taken:

1. Proper design of the die and tooling, including the selection of good hot working high strength steel.

2. Closely controlled heat treatment of the die tooling.

3. Education of all press personnel on the dangers involved in this operation.

4. Installation of mirrors to show die in press without exposing the operator to danger.

In the modern extrusion installation, the various pieces of auxiliary equipment include the billet reheat furnace, shape conveyor table, cutoff saws, stretchers, finish saws, etc.

Many safety features are engineered into the billet furnace. In general, gas or oil-fired furnaces used in the aluminum extrusion industry are not totally contained and therefore are not subject to destruction by accumulated explosive gases. Furthermore, each burner is equipped with approved electrically operated safety shutoff valves, which do not open unless all safe conditions exist.

In electrical induction billet furnaces, automatic overload controls are installed in addition to high temperature cutoff controls.

Saws Remove Fingers, Too

Cutoff saws have always been a source of frequent accidents in the press area. Saw blades should be enclosed as completely as possible to protect the operator's hands and fingers when reaching near the rotating blade. The painting of a severed, blood-dripping finger on this blade shield seems to be a most effective deterrent to saw accidents.

Goggles to protect the eyes from flying hot saw chips are also a must.

Thus far, we have described hazards and safeguards inherent in press and auxiliary equipment. But this discussion would not be complete if the everyday press operational hazards and preventative measures were not mentioned.

1. Neglecting to cut out power on the main electrical switch when working on the equipment. Men have been crushed to death between ram and container by this neglect.

2. In due respect for the tremendous pressures contained, it is extremely important that all the tie columns of the press carry equal loads. Should one column take most of the initial load due to improper adjustment, it will eventually fracture under the load and result in not only ruining the press but throwing things around the work area.

3. The lifting of heavy tooling is usually done with a mechanical hoist by hooking the cable to an eyebolt screwed into the die assembly for this purpose. Neglecting to screw the bolt in far enough has caused the bolt to pull out during the lift, resulting in fractured leg and foot bones.

4. Lifting of the average size billet is usually done with Boston type tongs (these resemble the old block ice handling tongs). If the points are allowed to become dull, the frequency of dropping the billets goes up and so does the incidence of toe and leg injuries.

To Prevent Slipping . . .

5. An adequate non-skid platform built at press areas is necessary to assure good footing and to enable a man to work and handle press tooling without overstretching, slipping or placing himself in dangerous spots.

6. Lubricating oils, greases and graphite create slippery surfaces and fire hazards if not closely controlled.

7. Solutions of caustic are often sprayed on the die bearing between charges to help clean the bearing or land of adhering aluminum. This creates a mist in the atmosphere that is dangerous to the eyes and skin of the worker. To control this, a draft is created by duct work adjacent to the die. The draft draws fumes through a water washer, ridding the air of caustic fumes. Eye protection must be worn in this area.

8. After each push or extrusion, approximately 10% of the billet is not extruded and discarded as a butt. These hot butts are usually thrown into a nearby scrap tub, and people can get hit unless butt tubs and personnel walkways are arranged so as to avoid this.

Reynolds Metals' Murphy

"A stream of hydraulic liquid escaping from [a hydraulic accumulator system] can easily penetrate a concrete wall six inches thick at a distance of ten feet."

Caution — Hot Stuff!

9. Extrusion press operation is necessarily a hot operation, and many burns of the hands and arms occur where carelessness is permitted. Asbestos pads and gloves are provided to handle and guide the hot tooling being positioned or to lead the hot extrusion as it is being extruded.

10. Emergency flood type showers should be installed at each press area to quickly douse any clothing caught on fire.

11. Maintenance of a good smooth runout table is necessary to prevent the shapes being extruded from hanging or catching on an obstruction, causing the hot shape to buckle or otherwise move against an operator.

12. Stretchers, which are used to stretch and straighten the extrusions, are particularly hazardous with regard to finger and hand injuries. The operator can very readily get his finger in the stretcher jaws with the shape or get it caught under the shape when a particularly twisted piece snaps into rigid straightness.

Dies Become Bombs When . . .

13. Maximum operating pressure limits must be established to avoid excess pressure from being used to unplug a die or for other reasons. Sudden applied pressures, or pressures held too long, may cause tool breakage and subsequent fragmentation, resulting in metal pieces of varying sizes being thrown into the work area.

14. Periodic and scheduled preventative maintenance on the press and auxiliary equipment is a must for good safe working conditions and production.

15. Good housekeeping is extremely important.

16. Above all — and this really should be listed number one, since this is the *first* thing done in any good operation — is training, not only at beginning of an operation, but continuously.

In conclusion, the safe operation of an extrusion press and its auxiliary equipment is not too different from that of any other industrial operation. Basically, the hazards must be recognized; then, all technical and engineering know-how must be applied to incorporate safety into equipment design. And last but not least, all personnel working with the equipment must be trained and educated in its safe operation. Safe thinking must be kept alive at all times.

As Shakespeare said: "In ourselves our safety lies."

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Wide Extrusions Make Strong Trailer Floors

Dow Chemical's 13,200-tonner extrudes 2-foot wide floor surface with integral I-beam cross members.

by G. Keith Glaza, The Dow Metal Products Co., Div. of The Dow Chemical Co., Midland, Mich.

A NEW design for highway trailer aluminum flooring combines cross members and floor surface into one extruded shape. Many benefits accrue to both builders and users of highway trailers as a result of this new application of wide aluminum extrusions.

Up to now, the most widely used all-aluminum trailer floor construction has consisted of relatively thin, narrow extruded flooring, laid on individual cross members spaced 12 to 24 inches apart. Flooring has been installed at right angles to the cross members and has generally been fastened in place with bolts or self-tapping screws.

Combines Floor, Frame

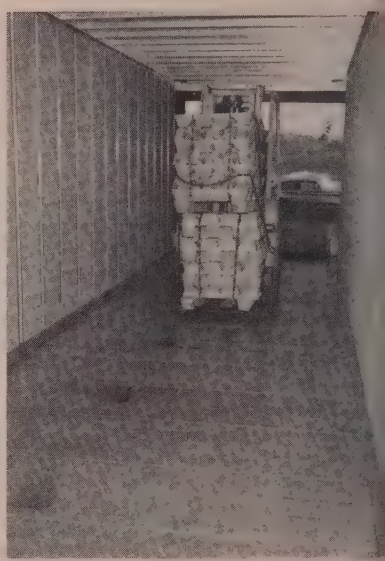
The composite floor, designed and produced by The Dow Metal Products Co., combines four cross members plus a 2-foot by 8-foot floor section surface into one high-strength extruded shape. The integrally extruded, I-beam shaped cross members are spaced six inches apart.

Four Inch Extrusions

The entire extrusion is 4 inches deep, which is as conserving of space as floors of lesser strength. The wide sections overlap a distance of 2 inches and are joined entirely by riveting.

In the new floor system individual wide panels are installed in the transverse direction. Thus it is referred to as a "transverse floor" as well as a composite or integral floor.

The special shape is extruded on a 13,200-ton press at The Dow Metal Products' Madison (Ill.) Plant. The tremendous pressures and huge die sizes associated with a press of this capacity make possible the extrusion of wide sections in long lengths.



■ *Transverse floor easily supports heavily loaded fork lift. Dow says new floor has about 50% more load carrying capacity than conventional floor of comparable weight. New shape is also said to be more resistant to dents and punctures.*

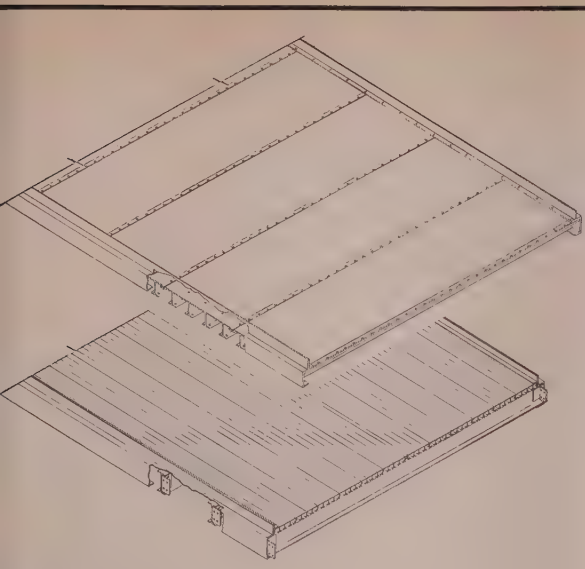
■ *Bottom view of trailer with Dow Metal Products' new composite floor. With floor surface and cross members combined in one shape, trailer builders can now make use of mass production methods such as gang punching and riveting in floors as well as walls and roofs.*

One major builder is now marketing trailers incorporating the transverse floor described above. Others have transverse-floored models in the design or

The transverse floor offers many benefits to the trailer user. It is as light as the lightest aluminum floor currently on the market and as strong as the heaviest. To boost the strength of a conventional floor structure, it is necessary to increase either the metal thickness or the total depth of the flooring extrusion and use either more or stronger cross members. Both of these changes add weight and sometimes decrease the usable interior space of the trailer.

Only 5.1 Pounds Per Sq. Ft.

At 5.1 pounds per square foot, the integral trailer floor is up to 500 pounds



■ *Sketch left compares composite and conventional aluminum trailer flooring. In Dow's composite (top), four cross members and wide floor surface are combined in one shape. Conventional floor uses narrow extrusions over individual I-beams.*

hter per trailer than previously availle floors of the same strength. The al thickness (4 inches) of the new or structure offers the possibility of increase in cubic content.

Other advantages of the transverse or:

1. It adds to the structural integrity of the entire trailer. With large panels properly riveted together, the floor will remain square throughout the life of the trailer, thus improving tracking and minimizing roof strain, a cause of leaks. Because of the closer spacing of cross members, load is distributed more evenly into the sidewalls.

2. It reduces floor maintenance to an absolute minimum. The composite floor is designed to accommodate loads up to 9 tons on the front axle of a forklift truck. This is about 50% greater than the limit of conventionally floored vehicles of comparable weight.

3. It is much more rugged and resistant to wear, punctures, and dents because the top surface is approximately twice as thick as other lightweight extruded aluminum flooring now in use.

4. It provides a completely watertight and dust-tight floor because joints are riveted and sealed in the same manner as the sidewalls of the trailers.

Promotes Mass Production

Trailer manufacturers have already employed mass production techniques in roof, sidewall and door construction. Applying the same techniques to the installation of flooring over separate cross members has proved more difficult. But the new composite design makes practicable the use of gang punching and riveting or automatic drilling and riveting equipment.

In addition, the new flooring accommodates any combination of running gear spacing because the entire floor structure clears the tires. This feature assists standardization between trailer models.

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Aluminum and Neoprene Extrusions Save Dollars, Hours in Low-Rise Construction

Zipperwall, a curtain wall system composed of factory produced components, hermetically seals walls, eliminates metal-to-glass contact, offers economies of mass production, erects speedily to minimize labor expenses.

NEOPRENE and aluminum extrusions have been combined to form Zipperwall, a curtain wall system which, according to Kawneer Co., Niles, Mich., speeds construction of low-rise structures, minimizes parts and labor costs, and eliminates condensation problems.

The system is quickly erected because glazing and decorative panels are literally zipped into place without using fasteners, caulking, etc. It is inexpensive because the parts can be mass produced, then simply installed without high labor costs. Zipperwall also is immune to the condensation problems of other curtain wall systems because there is no metal-to-glass contact.

Aluminum elements in the system include sill and head adapter angles and a one-piece mullion, all extruded by Kawneer from 6063 alloy, and roll-formed sill and head runners made of the same alloy. Main portion of the hollow mullion is 1½ inches wide by 3⅜-inches deep. It has a T-shaped flange along one side which is ¼-inch thick. Pieces have an Alumilite finish.

But the unique feature of the system is the "zipper" — an H-shaped neoprene gasket which connects mullions to infill components and holds them firmly in place (see photo). The gasket also acts as weatherstripping.

The neoprene gasket has ¼-inch channels within its H-shape. These channels are enlarged when an extruded-in hinge running the length of the strip is open. This allows glazing or infill panels to be easily inserted, or the strip to be quickly slipped over mullion flanges.

But once parts are in place, the hinge is zipped closed with a special tool. Small claws on the inside edges of the strip channels grip glass or metal components tightly — so tightly, in fact, that the resultant hermetic seal prevents leakage and gives framing elements a U-value approximately the same as that of 1-inch thick insulating glass.

Erection is fast and simple, once workmen have been trained in handling the various components, says Kawneer No cumbersome equipment is needed; only the special zipping tool, which locks the hinge in place or opens it for replacement of glass, etc., an electrical power saw, since neoprene and other framing elements are cut at the site, and power drills and screwdrivers. Site preparation and structural system are conventional.

In erection, adapter angles are cut to size, fastener holes are drilled, and parts are then secured to the floor base and ceiling head. Sill and head runners are then cut, tapped and temporarily bolted in place. To complete the Zipperwall frame, factory cut mullions are placed at specified intervals and permanently bolted to sill and head runners.

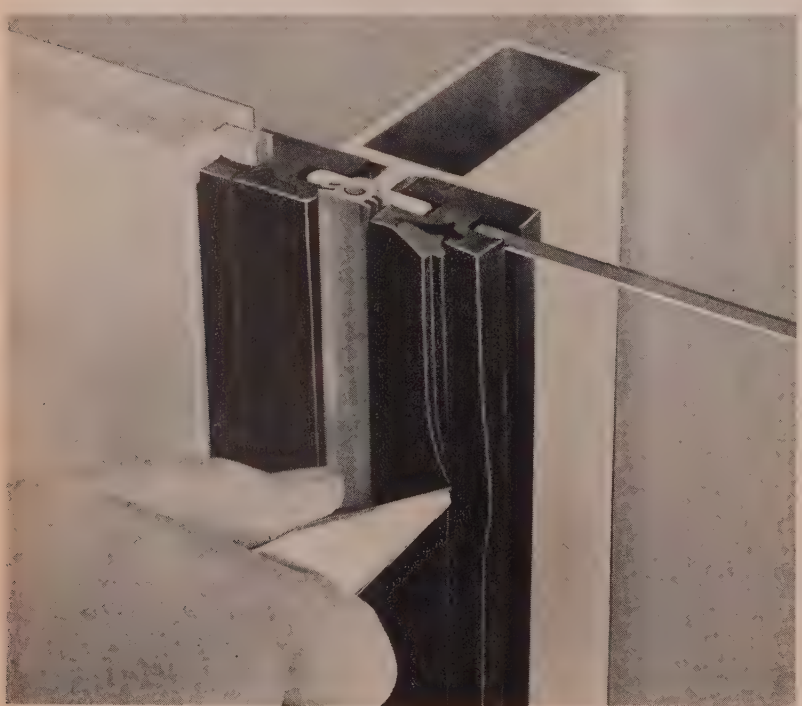
Next, neoprene gaskets are pressed into place along all four inboard flanges and bonded together at the corners with a special adhesive. Infill panels and glazing are then pushed into the other half of the H-shaped strip, and horizontal cross-pieces are placed where necessary. Then a workman, using the special tool, zips the neoprene gasket hinges shut, thus securing components and mullions and hermetically sealing the walls.

When the neoprene gaskets are used to hold horizontal members in place, the gaskets actually become a structural part of the frame. In this capacity the gasket transmits to the mullion static loads of the glass and panel, as well as live loads imposed upon them.

The final component to be placed is a vinyl weatherstripping which slips between two neoprene extrusions and the top edge of the mullion T-flange. This provides a flat interior surface, and minimizes heat loss by preventing the mullion from conducting heat to the outside or cold to the inside.

The framing system can take glass in 3/16, 7/32 and ¼ inch widths, hopper or projected windows, and all Kawneer doors. Panels ¼-inch thick can also be inserted, as can a new panel specially designed for the system.

The 1-inch thick panel has flanged pans formed from pre-coated aluminum and a core composed of expanded perlite, glass fibers and asphalt. The facing flange, with spacers, makes up the ¼-inch thickness required for incorpo-



■ *Special tool is being used to zip neoprene gasket closed and secure ¼-inch glazing. Note how panel to left is flanged to fit into gasket. Gasket closing is done from inside and you can see flush surface which results once vinyl weather-stripping is placed between gaskets and alongside of mullion T-flange.*

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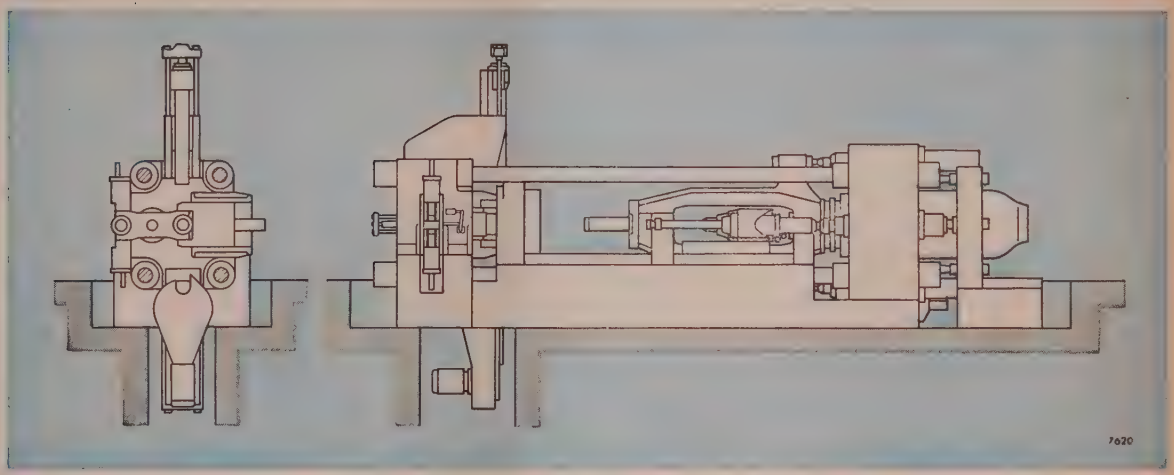
You are invited to contact us for complete information on these presses.



Horizontal extrusion press for non-ferrous metals with rotary die head and internally-arranged piercer.

Features and advantages

- Good accessibility to the press and tools through effective arrangement of the columns, tie-bars and guideways, and through a long-stroke container shifting device.
- Simple and quick tool changing through a rotary die head, die changer and quick-action locking arrangements.
- Speedy removal of the extrusions by severing behind the die. (Axial displacement of the die).
- Compact design of the press and efficient mandrel guidance through an internally-arranged mandrel manipulator or piercer with mandrel stroke adjuster, mandrel stroke limiter, relative stroke mechanism and mandrel turner.
- Improved quality of extrusions and longer tool life through the incorporation of cooling arrangements for the billet container, die and mandrel.

Inspecting a 2750-ton extrusion press of the four-column type, with rotary die head, demonstrated under workshop conditions on the occasion of the SCHLOEMANN Congress held at the MAN plant at Nuremberg.

FELLER ENGINEERING COMPANY 1165 Empire Building, Pittsburgh 22, Pa.

■ *This is the Cassopolis High School addition. Appearance is aided by use of ceramic tile panels along bottom; heavy black lines of neoprene zipper gasketing surrounding elements. Low cost of system enabled architect to use tiled sections.*

ration into the Zipperwall gasket.

Rubber gaskets have been used in the past for glazing custom installations. And Kawneer recognized the potential economies and functional advantages of the method and designed Zipperwall for the huge market of low-budget schools, apartments, factories, hospitals, dormitories, clinics, government buildings, etc. As of now, structures up to 24 feet high can be Zipperwalled using uninterrupted mullions that are properly anchored to a continuous perimeter sill.

Several tests have been performed on the Zipperwall system. A static chamber test was conducted to prove the quality of the hermetic seal; a windload table was developed; and Zipperwall was used on one section of the Kawneer research and development laboratory.

The final and most crucial test occurred last year when Zipperwall was used to clad a new addition to the Cassopolis High School in Cassopolis, Mich. On this first application several erection procedures were also experimented with.

Using the Cassopolis school as a basis, Kawneer figures that Zipperwall components and labor costs are from 20% to 25% less than those of conventional curtain wall systems; that in spite of being a stick system, Zipperwall goes up as fast as a factory made curtain wall unit system.

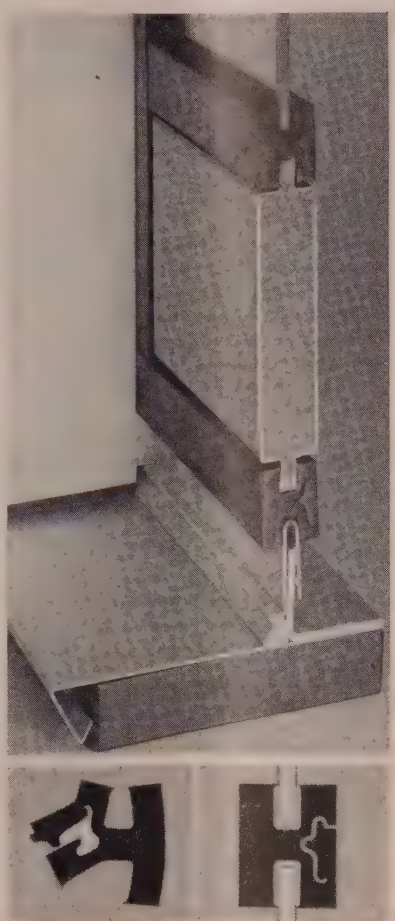
An authoritative endorsement of the advantages of Zipperwall is offered by J. L. Boller of J. L. Boller and Associates, Niles, Mich., architect who handled the Cassopolis school job. Boller claims the system helped him solve many problems and overcome the limitations of a small budget.

"The new Zipperwall system, which provides gasketing, panels and aluminum mullions all in one package, answered our cost-cutting problem by simplifying construction," he says.

Final costs of the school averaged out to $10.95 a square foot, Boller reports. This is low when compared to the national average of $14 to $16 for school construction.

Boller explains that "on the Cassopolis project, we found that by using the Zipperwall system we cut construction man-hours by at least 25%." This was true despite the time it took to acquaint workers with new glazing techniques, he adds.

"After initial training, speed began to pick up, and that's when cutting and fitting of the zipper strip right on the job began to pay off," he adds. "First, there were no lost man-hours because a piece had to be returned to the fabricator to get a better fit for an opening. Also, fabrication of odd-shaped pieces, often time-consuming and expensive, was eliminated because custom fitting was done right on the job."



■ *Cross-section of installed Zipperwall components shows adapter angle at bottom, sill runner clamped over angle and zipped up gasket running along sill runner. Various cladding elements are combined easily, here paneling at bottom, glazing at top. Drawings show gasket when hinge is open so infill elements can be inserted (left); gasket after panels are in place and hinge zipped closed (right).*

Boller discovered other construction economies after erection began. Installation of both panels and sealing gaskets could be done from the inside so scaffolding wasn't needed, and only vertical structural members were required. This reduced the size of footing needed since the extra weight of horizontal members did not have to be supported.

"These economies," says Boller, "enabled us to use colorful ceramic tile panels beneath exterior glazing, so as to enhance the building's appearance."

Boller cautions, however, that "economies alone can't tell the entire story when you're working with curtain walls. Many times several problems will occur after an 'economical' building has been completed. But this hasn't been the case at Cassopolis, where even curtain walls' main problem — moisture condensation coming from direct metal-to-glass contact — has been eliminated.

"The best proof I can offer of that fact is that the Cassopolis school, which was finished over a year ago, has never had wet walls, cabinets, or books beneath glass panels. And at the same time heat loss, traditional where metal mullions are used, has been reduced considerably."

The secret of leak prevention in the system, of course, is the tight grip the zipper gasket applies to mullions and infill panels. This grip also offers an important safety factor. "If a baseball should be driven through one of the 14-foot or smaller panels," Boller claims, "there is no chance for glass to come cascading down on bystanders, for the neoprene gasket will hold the glass firmly in place from all sides and at all points of contact."

The Cassopolis school, clad with 5000 square feet of Zipperwall elements, contains eight classrooms, a library, and administrative spaces. The one-story structure accommodates 200 students; is 276 feet long by 74 feet wide.

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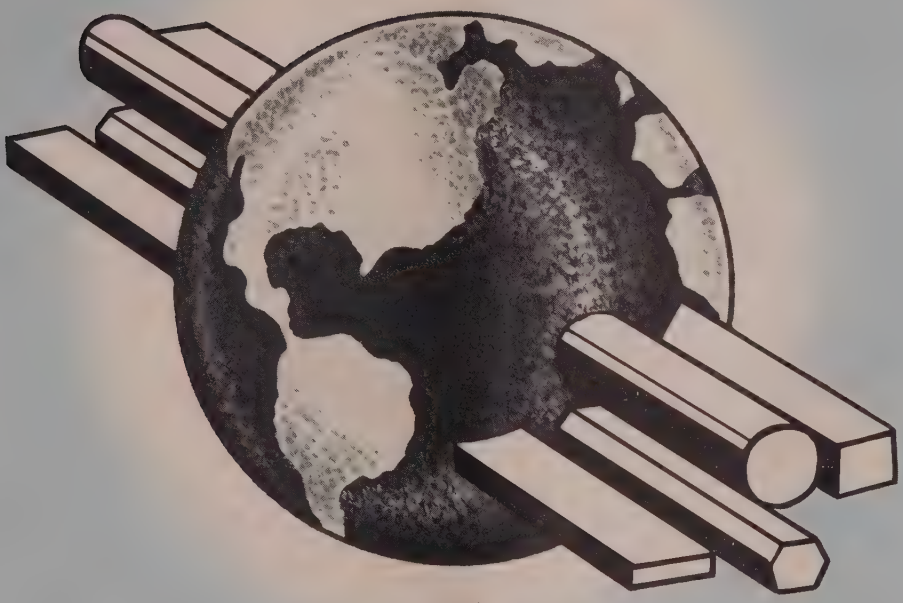

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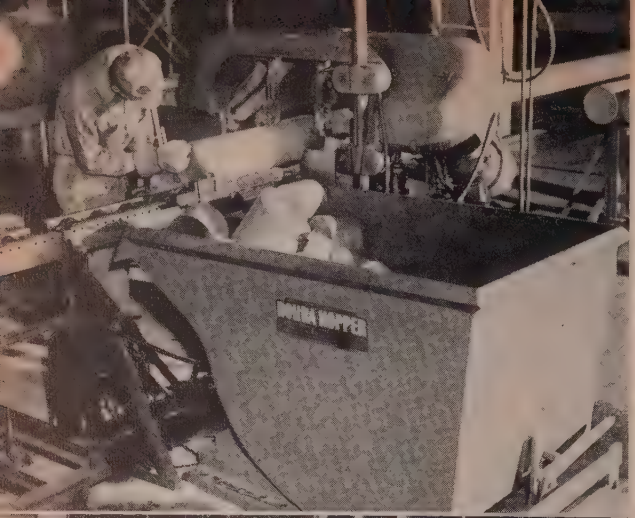
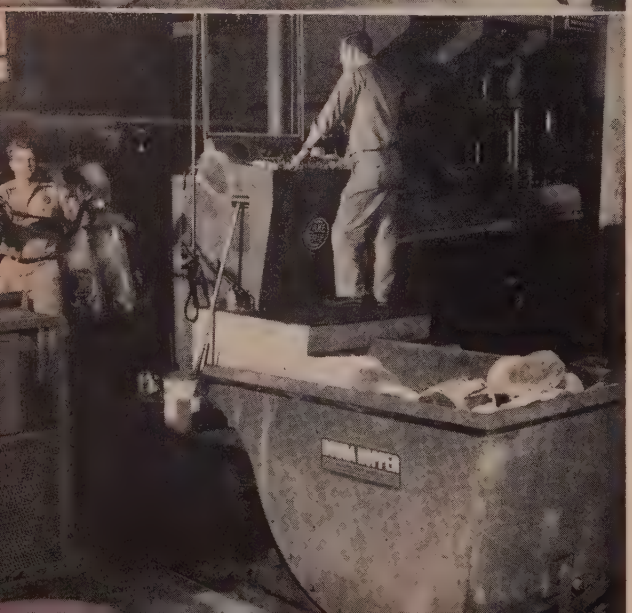




Extruder Slashes Scrap Handling Time 50% With Self-Dumping Hoppers

SELF-DUMPING hoppers enable American Art Metals Co., Atlanta, Ga., to dispose of scrap metal twice as fast as when steel drums were used.

The plant's scrap is generated during the extruding, cutting, and forming of aluminum architectural products such as building entrances, curtain walls, etc.

Scrap consists of billet butts, extrusion trimmings, and both wet and dry saw chips. All scrap is collected and remelted, except for oil-soaked saw chips.

Prior to handling scrap with hoppers, the company used steel drums which were difficult to handle and had to be dumped manually. Two men were needed to empty drums which weighed as much as 250 pounds filled. Manual dumping also invited accidents.

In a move to streamline scrap handling, the company replaced the drums with 12 self-dumping hoppers of ¾ cubic yard capacity made by Roura Iron Works, Inc., Detroit 14, Mich.

The hoppers are mounted on skids and are handled and dumped quickly by a fork lift truck. Workers do no lifting at all. More time is saved because the hoppers have a larger capacity than the steel drums did, and therefore require emptying less frequently.

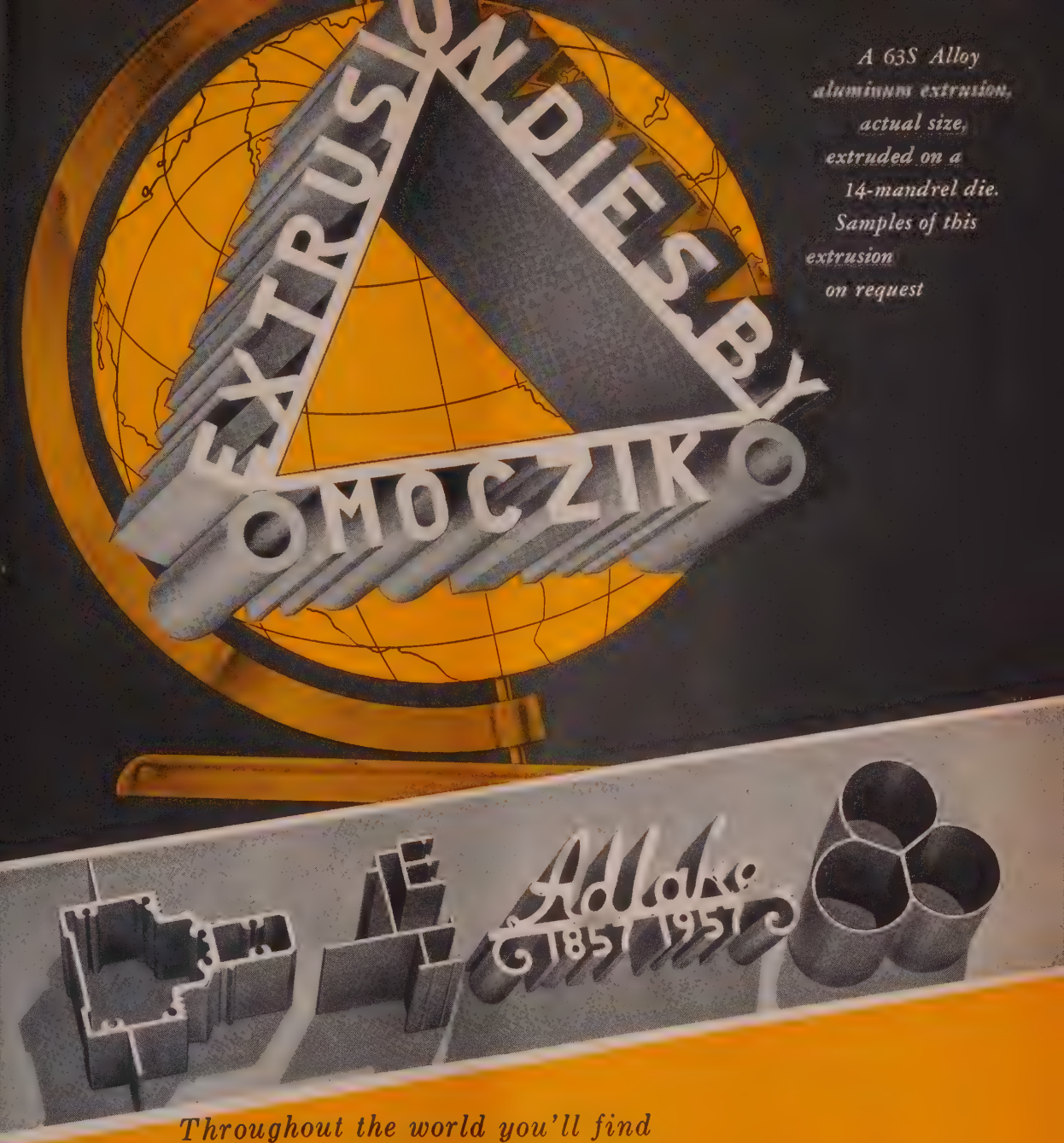
This ability to dump loads faster, coupled with the need to make fewer trips, has cut scrap handling time in half, explains E. L. McNiff, Art Metals vice president of manufacturing.

Hoppers are spotted where scrap generation is heaviest. Billet trimming and extrusion operations, for example, create most of the scrap. In these areas, hoppers have simplified operations considerably.

Billets must be cut to different lengths to minimize the amount of scrap remaining after they are fed through the extruding press. Ends of the 8 inch diameter, 16 feet long logs are also trimmed to remove metal of non-uniform density (top photo).

These trimmings and ends are collected in a hopper positioned beside the saw. When a full hopper load is accumulated, a fork truck takes it to the furnace for remelting. The fork truck raises the hopper to the furnace charging opening where scrap is quickly dumped, the operator simply tripping a release handle on the rear of the unit which permits the hopper to dump and automatically right itself (center photo).

In another operation, trimmed billets are fed into two 2300-ton extrusion presses which produce channels, angles, I-beams, and other structural and architectural shapes. At the end of each extrusion cycle, a small section of the billet remains and is ejected at a temperature of 850° F. A press attendant picks up these butts with tongs and tosses them into a nearby Roura hopper (bottom photo). About two hopper loads are collected here each shift.



A 63S Alloy aluminum extrusion, actual size, extruded on a 14-mandrel die. Samples of this extrusion on request

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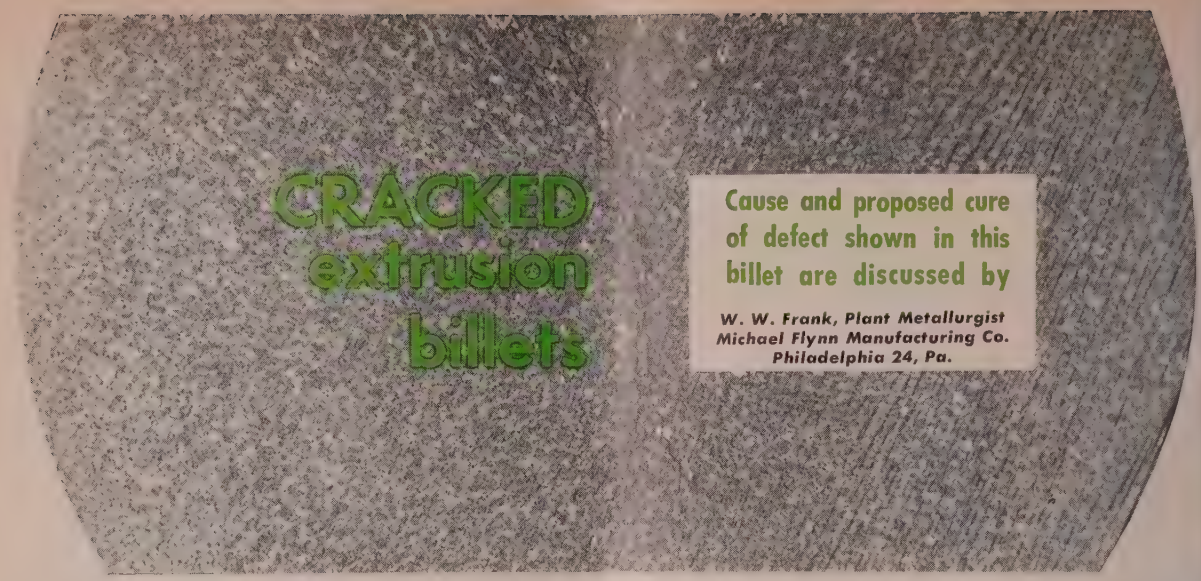

CRACKED extrusion billets

Cause and proposed cure of defect shown in this billet are discussed by

W. W. Frank, Plant Metallurgist
Michael Flynn Manufacturing Co.
Philadelphia 24, Pa.

IN EXTRUDING aluminum, an aluminum billet, usually round and with a diameter of 3 to 30 inches and of varying length, is extruded at an elevated temperature through a steel die to become a finished or semi-finished product.

In order to produce good extrusions, the billet must be of good quality. One of the most common physical defects in a billet is a center or "star" crack running the length of the billet. Such cracks harm the extruded product by giving a poor finish and inferior physical properties. They may also damage the extrusion press by expanding the billet and jamming the billet heater, or by upsetting prematurely in the press container when put under pressure.

Most billets for the aluminum extrusion industry are produced by the direct chill (D.C.) casting method. This article deals with the causes of cracked billets in this process, and the control and elimination of this problem.

In the D.C. process, molten metal is fed into a water-cooled mold whose bottom is plugged at the beginning with a mold stool (Fig. 1). As the mold fills up and a shell of solidified metal forms, the mold stool starts on its way down, controlled by a hydraulic dropping mechanism. A water spray upon the billet's periphery removes the remaining heat and completes solidification of the billet's interior.

Causes of Cracking

At the end of the cycle the solidified billet is 12 feet long or longer, and must of course be cut to shorter lengths to fit into the extrusion press.

The factors that may influence cracking are, for the most part, interdependent. In the following list each item must be considered in relationship to all of the other considerations.

1. *Pouring temperature*: The higher the metal temperature, the more chance of getting cracked billets.

2. *Alloy involved*: Of the dozen or more aluminum alloys commonly used in the extrusion industry, each must be studied closely to obtain optimum pouring conditions.

3. *Nucleation agents*: Titanium, boron, zirconium, or combinations of these elements may produce better solidification of the billets when added to the melt prior to pouring.

4. *Water temperature and pressure*: The water used to cool the molds and the emerging billets can be critical if variations in temperature or pressure occur.

5. *Billet diameter*: The larger the billet, the more susceptible it is to cracking.

6. *Dropping rate*: Also known as pouring rate, this factor is very important. If the dropping rate is too fast, cracked billets will result. If it is too slow, cold shuts will appear on the billet surface and production will be lost because of the slower speed.

Number of Billets Important

In addition to the above, the number of billets being poured at one time complicates the issue. At Michael Flynn's Philadelphia plant, we pour 18 eight-inch diameter billets or 22 six-inch diameter billets at one time. Due to variations in flow of water to only one or two molds, it is possible to have a drop in which one or two billets are cracked and the others are perfect.

Under production conditions at Michael Flynn, we find that the only factor over which we have direct control during the process is No. 6, the dropping rate. Therefore, whenever cracked billets are found, we define the cause of them as having been "poured too fast for conditions."

Although it is apparently simple enough, this statement is really an extremely complex equation. In order to solve this equation to find the optimum pouring speed (the fastest lowering rate we can use without getting cracked billets), it would be necessary to set it up as a function of at least five variables (factors 1 through 5).

This would be difficult, if not impossible, to solve. We needed a more practical approach; we needed to find a single parameter that would reflect the effects of the five variables mentioned, and allow us to adjust our pouring rate accordingly.

Considered Ultrasonic Testing

We investigated the possibility of using ultrasonic testing equipment to detect cracks. This equipment is fairly expensive, and would require additional manpower, in addition to possibly raising maintenance problems. Also, such testing detects cracks only after pouring has been completed; it does not allow in-process control.

We decided to try something much simpler. We made up a dip-stick of ¼-inch diameter stainless steel rod, about 20 inches long, notched every inch for measuring purposes and coated with lime. Our D.C. operator was asked to dip this into the molten crater of several billets during each drop and record the depths that he found.

This information was accumulated for several weeks, along with melt analysis involved, metal temperature, water temperature and pressure, mold diameter, and dropping rate. Then, as the extrusion department reported cracked billets from time to time, the conditions under which these billets were poured could be pinpointed.

As we accumulated and attempted to relate this data, it became apparent that all cracked billets came from melts cured with a crater that was too deep. our 6063 alloy 8-inch diameter lets, for instance, we discovered that, almost every case, cracked billets re from melts poured with a crater pth of more than 7½-inches.

acking Slashed 90%

This information was quickly put to t in our billet casting department. C. operators were given instructions at if, when measuring the crater depth th the dip-stick, they found a crater ore than 7½-inches deep, they should w the lowering rate. Within a fort-ght the incidence of cracked billets s cut by 90%, and has remained at low level ever since.

Most of Michael Flynn's production in 6061, 6062 and 6063 alloys. The oys have proven amenable to the ater-depth control outlined above. he higher strength alloys, such as 24 and 7075, are much more prone crack due to higher stresses set up ar the cooling skin of the billet while e center is still hot-short. Our dip-ck method of control might not prove tirely feasible for these alloys.

We still find a cracked billet from ne to time, but this is probably due the fact that our D.C. operator can-t check from 18 to 22 molds during e course of every drop, and one or o of the molds he does not check may ve an irregular flow of water contrib-ing to a cracked billet.

However, by the use of 20 cents rth of steel rod, and with the coopera-n of the men on the job, we have ne a long way toward eliminating s serious problem.

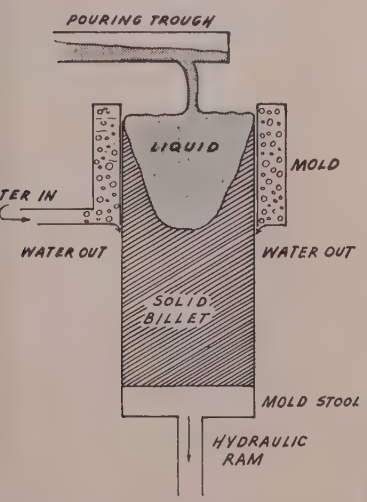

Fig. 1. Simplified diagram of D. C. billet ting process. A notched dip stick is d to measure depth of molten crater, s indicating if pouring rate is too high.

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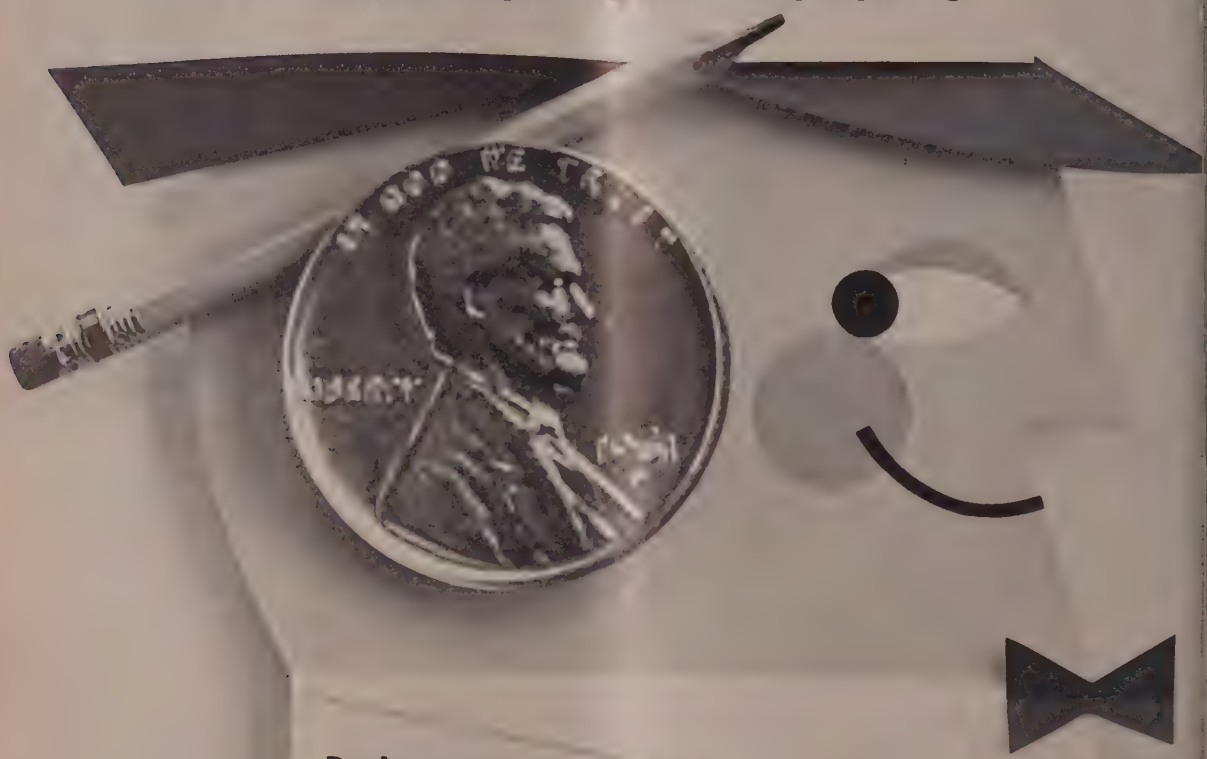


Design an aluminum extrusion, win $2500, $1000 or one of five $100 awards.

SOME WORDS OF ENCOURAGEMENT

It makes no difference whether your design idea is only now budding in your imagination, nurtured on your drawing board . . . accepted, rejected or utilized by your company. All designs using aluminum extrusions are welcome.

Whatever you're designing now, complete product or component part . . . try redesigning it using aluminum extrusions. Maybe a sticky design problem can be solved by developing a never-before-extruded shape that will take the place of a machined, formed or welded assembly, or one that, when sawed into sections, will reduce machining cost . . . or provide other product benefits.

First Place Winner Will Receive $2500. Runner-Up Will Win $1000. And Five Third Place Entries Take $100. each. All Entrants Receive a Bright, New Penny!

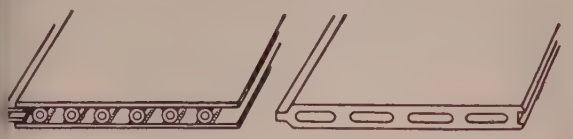
THE JUDGES AND HOW THEY CAN HELP YOU WIN

The top twelve designs selected by Kaiser Aluminum will then be finally judged by executives of the Independent Extruders listed on the opposite page. Your entry will be judged on the basis of originality of concept, product improvements, production cost and time savings, and other resultant or projected advantages that aluminum extrusions make possible.

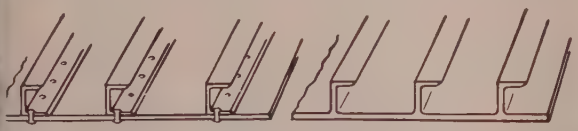
For a better idea of the vast applications for extrusions and for any technical assistance you may need, contact the Independent Extruder nearest you (see list on opposite page). You can call on his and Kaiser Aluminum's vast extrusion experience to give you expert technical guidance in selection of alloys, tolerances, mechanical properties, tooling and extrusion costs.

lo Contest Is Complete Without Clues

o help you get started on your winning design . . . here are just a few xamples of extrusions and the parts they replace.



ETTER HEAT TRANSFER . . . The extrusion process makes possible the integral shape shown at right, above. This design provides reater area for heat transfer and minimizes assembly costs.



OWER WEIGHT, FASTER ASSEMBLY . . . Several different hapes can often be combined into a single extrusion. The integrally iffened panel above, right, weighs less, reduces joining cost.

GREATER DESIGN FREEDOM . . . This gunwale provides structural strength as well as good appearance. Made as an extrusion, it provides for interlocking, decorative and utilitarian bumpers as well as color strips. No other process allows the styling and low upkeep possibilities found with Aluminum Extrusions. And extrusion dies are inexpensive compared with tooling costs for other types of fabrication. Fasteners are hidden and no welding is necessary.

LESS MACHINING . . . The low inertia hollow rotating member is manufactured from a close tolerance extrusion. It is sawed into sections from a continuous profile rather than from machined castings or bar stock. The extrusion process reduces expensive tooling, scrap and production time.

low Start Thinking And Designing...It Could Mean Cash For You!

low To Submit Your Winning Entry.

.. All drawings and descriptions must be submitted on white paper no larger than 16" x 20" with the name of your extrusion design and your name and address typed or printed on the upper left corner of each page. Official entry blank must be included.

2. Each design submitted must clearly show the functional purpose of the extrusion.

3. Include a description of your design, its purpose and advantages and any comparisons between the new design and the product or component it might replace.

4. Photographs of existing components, products or your new design may be submitted along with your entry.

5. Contest entries must be postmarked before midnight, August 31, 1961. Winners will be notified by mail before November, 1961.

ONTACT THE INDEPENDENT EXTRUDER NEAREST YOU

or expert advice on all extrusion problems or for additional entry blanks.

ARKANSAS

uthern Extrusions, Inc.	Magnolia	CE 4-4260

CALIFORNIA

e Aluminum Extrusion Co.	Los Angeles	CL 5-1511
nerican International	San Jose	CY 8-1606
& T Metals Co.	Los Angeles	RA 3-4501
taco Extrusions, Inc.	Orange	KE 2-6331
wneer Company	Richmond	BE 2-1821
chael Flynn Mfg. Co.	City of Industry	CU 3-6407
cific Extrusion, Inc.	Watsonville	PA 4-2244
x Metal Corp.	Van Nuys	TR 3-2720
xas Aluminum	Mojave	VA 4-4021

FLORIDA

nerican International Aluminum Corp.	Miami	NE 4-8591
neral Aluminum Fabricators	Miami	TU 7-8231
iami Extruders, Inc.	Miami	OX 1-8900
gal Extrusion Corp.	Miami	NE 3-8128
are Laboratories, Inc.	Miami	NE 4-8511

GEORGIA

xcreen Co., Inc.	Chamblee	GL 7-6394

ILLINOIS

awneer Company	St. Charles (Chicago)	MA 6-2281
nkead Industries, Inc.	Chicago	IN 3-7800
ala Extrusions, Inc.	Rock Island	788-9321
ecision Extrusions, Inc.	Bensenville (Chicago)	NA 5-4600

INDIANA

reater Louisville Industries, Inc.	Jeffersonville	BU 2-4341
ainline Extrusions, Inc.	South Bend	AT 8-9244
ells Aluminum Corp.	North Liberty	OL 6-8111

IOWA

itus Metals Corp.	Waterloo	AD 4-1771

MASSACHUSETTS

ortheast Aluminum, Inc.	Lawrence	MU 3-2718
Royce Aluminum, Inc.	Taunton	VA 4-8631
Trim Alloys, Inc.	Boston	AN 8-5200

MICHIGAN

Aluminum Extrusions, Inc.	Charlotte	543-2010
Brazeway, Inc.	Adrian	CO 5-2121
Detroit Gasket & Mfg. Co.	Detroit	KE 1-3400
Ferguson Extrusions, Inc.	Detroit	TE 4-5081
Light Metals Corp.	Grand Rapids	RI 2-3481
Midwest Aluminum Corp.	Kalamazoo	FI 5-8155
North American Extrusions Corp.	Kalamazoo	FI 5-8610
Purpose Extruded Aluminum	Hudson	HI 8-2551
Quality Aluminum Products Co.	Coldwater	BR 8-2381
Rogers Industries	Detroit	VE 8-7500
Valley Metals Products Co.	Plainwell	MU 5-8711

MISSOURI

Hazelwood Engineering & Equipment Co.	Hazelwood (St. Louis)	PE 1-2274

NEW JERSEY

Corson Industries	Delair	NO 2-5500
Mideast Aluminum Corp.	Dayton	DA 9-8113
New Jersey Aluminum Extrusions	N. Brunswick	CH 9-6867
Warner Mfg. Corporation	Bloomfield	PI 8-5000

NEW YORK

Alan Scott Aluminum	Westbury	ED 4-1800
Aywon Wire & Metal Corp.	Brooklyn	TE 9-1000
Badger Aluminum Extrusions	Brooklyn	NI 9-6400
Empire Extrusions Corp.	Garden City Park, L. I.	PI 1-6600
Jarl Extrusions, Inc.	E. Rochester	LU 6-2660
Jasco Aluminum Products Div. of Irving Air Chute Co.	New Hyde Park	FI 3-4300
Jerex Corporation	Amityville	MY 1-7270

NORTH CAROLINA

Carolina Aluminum Co.	Winton	358-4111

OHIO

Alsco, Inc.	Akron	BL 3-7701
B & T Metals Co.	Columbus	CA 8-5411
Calex Corp.	Campbell	PL 5-9679
General Extrusions, Inc.	Youngstown	ST 8-9681
Magnode Products, Inc.	Trenton	YU 8-6331
National Extrusions & Mfg. Co.	Bellefontaine	LY 2-9010
F. A. Pilgrim Co., Inc.	Youngstown	ST 8-4077
Saramar Aluminum Co.	Youngstown	SW 9-9741
F. E. Schumacher Co., Inc.	Hartville	TR 7-9307
Weather-Seal, Inc.	Barberton	SH 5-2114
Youngstown Mfg., Inc.	Youngstown	RI 3-1161

OKLAHOMA

Macklanburg-Duncan Co.	Oklahoma City	JA 8-4411

PENNSYLVANIA

Airmaster	Philadelphia	BA 3-7700
Michael Flynn Mfg. Co.	Philadelphia	FI 2-5500
Penn Brass	Erie	TE 8-1931
Pittsburgh Aluminum Alloys Co.	Pittsburgh	BR 1-4744
R. D. Werner Co., Inc.	Greenville	JU 8-8600

SOUTH CAROLINA

Extruded Aluminum Co., Inc.	Summerville	TR 3-2381

TEXAS

Bauer Aluminum Co.	Dallas	AD 5-2357
May, Inc.	Houston	MO 7-1780
Texas Aluminum Co., Inc.	Dallas	RI 1-3361

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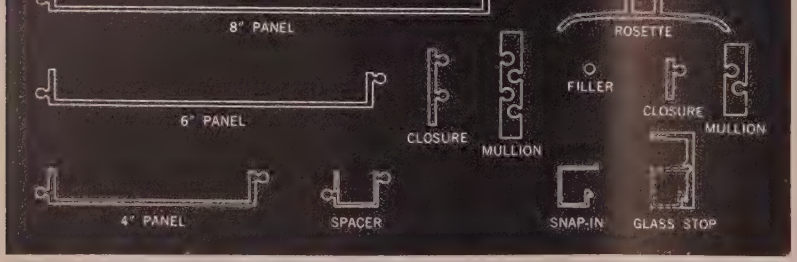
Extrusions Give Screen System DESIGN VERSATILITY

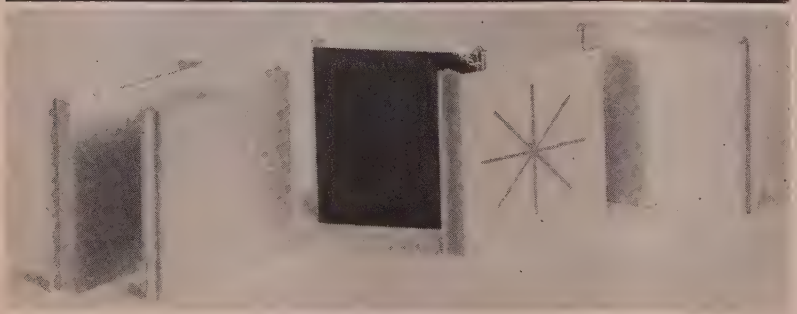
Extruded aluminum panels, mullions, othe shapes slip-fit together to create nearly any design effect in remodeling facades (as shown at left), solar screens, enclosures vision barriers, other types of screens

CURTAINSCREEN is an integrated system of extruded aluminum mullions, panels, and other parts that enables the architect or interior designer to create nearly any decorative effect in solar screens, interior and exterior partitions, new facades for old buildings, vision barriers, and enclosures for elevator shafts, cooling towers, and the like.

Developed and distributed by Julius Blum & Co., Inc., Carlstadt, N. J., the system is based almost entirely on a coordinated group of interlocking slip-fit aluminum extrusions (cross sections of main parts are shown below). The aluminum components, in alloy 6063-T5, are supplied in a variety of finishes including plain (for anodizing or enameling), anodized, etched with decorative designs, or laminated with wood veneers. The few plastic components are black; will be supplied in other colors later.

But the designer is not limited to aluminum and plastic alone; the system will readily accommodate other materials such as panels of wood, glass, plastic sheet, fiberglas sheet, and the like. Thus, an enormous range of colors, textures and patterns can be manipulated to serve almost any decorative or functional requirement in screens, railings and enclosures.





■ *Principal extruded aluminum components of Curtainscreen system are shown in cross section drawing above. Closures and spacers are also supplied in black plastic. Patterned and walnut veneer-faced panels are shown in photo.*

An added feature — one found in few if any, modular screen systems — is the ability to form single or dual plane screens for 3-dimensional effects or for free-standing structures that must present a finished appearance on both sides. Room dividers and railings are examples.

Principal structural elements of Curtainscreen are the two mullions. Both are ⅜-inch thick and are supplied in either mill finish or anodized, and in lengths of up to 20 feet. The larger mullion is 1⅞-inches wide, and weighs .670-pound per foot. It has two sets of slots to accommodate mating parts such as panels. The 1¼-inch mullion weighs .468-pound per foot and has one set of slip-fit slots.

Aluminum closures for both mullions are available in lengths of up to 20 feet with mill finish or anodized. Black plastic closures are supplied in lengths of up to 16 feet. Purpose of these parts is to finish off the end of a screen (i.e., conceal the slots) or to serve as the joining member when a Curtainscreen is attached to an adjoining floor, wall or ceiling.

Principal decorative elements are extruded panels, available in 4, 6, and 8-inch widths. Panels with anodized or mill finish are supplied in lengths of up to 20 feet. Those having laminated walnut veneer finish can be had in 12-foot lengths. The company also supplies shorter lengths of panels with three different etched designs (shown at left). Finish of these is either gold or silver.

For special decorative effects — in railings, room dividers, etc. — there are concave-faced rosettes. They are supplied in 20-foot lengths with plain or anodized finish; 12-foot lengths with walnut veneer.

Rounding out the system are a glass

1200 billets extruded in 24 hours!*

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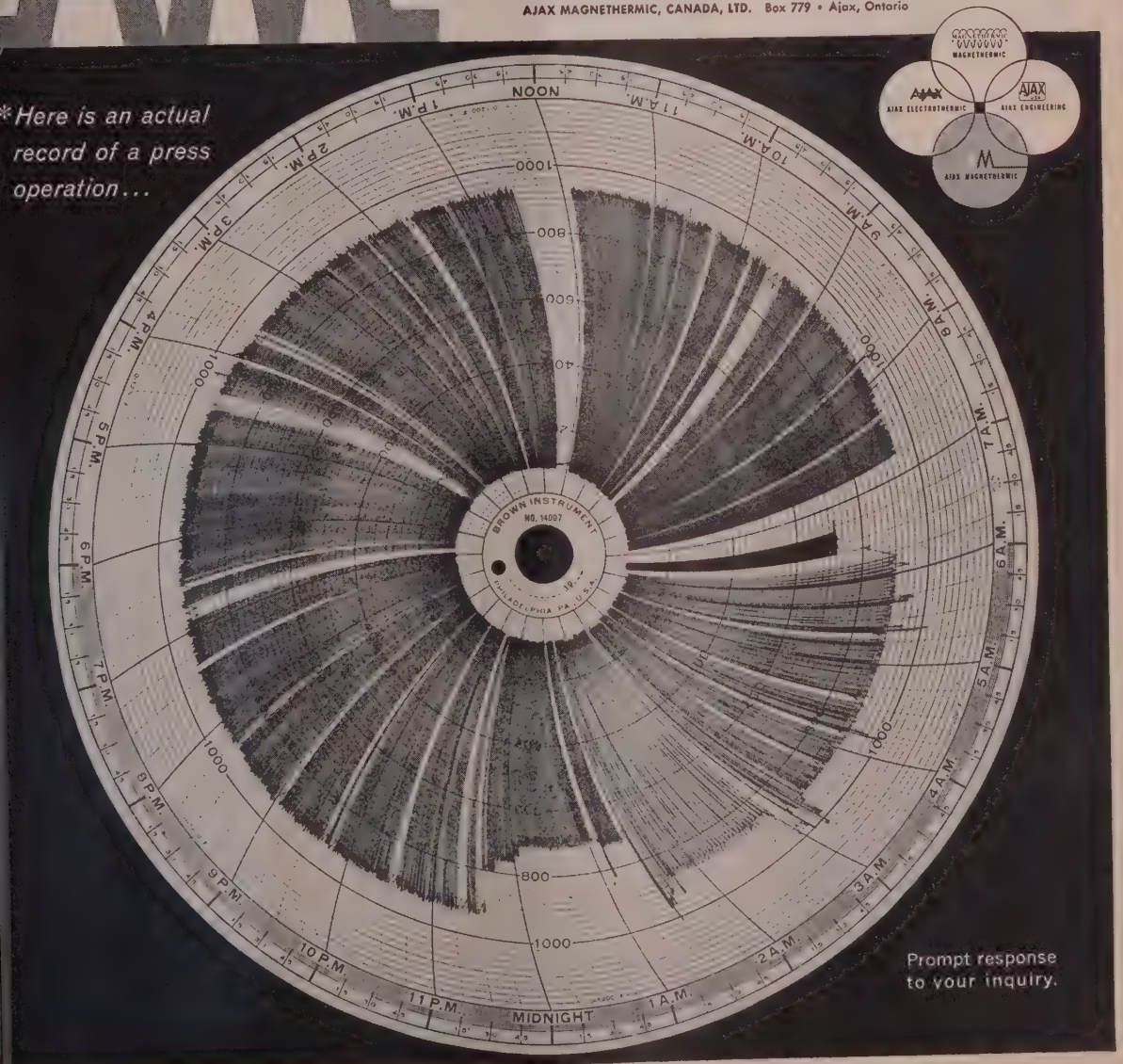


stop with separate snap-in lock (for combining other panel materials or glazing with Curtainscreen); aluminum and plastic spacers for small increment spacing of mullions of adjoining panels; and 3/16-inch diameter aluminum filler rod to insure accurate placement of panels according to the particular design.

With exception of the filler rod and the plastic spacers, these shapes are supplied in lengths up to 20 feet.

For Bigger Installations . . .

Although maximum length of panels and mullions is 20 feet, greater lengths can be achieved by mounting assemblies end to end. By the same token, almost any width of Curtainscreen is accomplished by mounting assemblies side by side. Accurate alignment of end-to-end mounted panels is achieved by inserting filler rod in the end of mating mullions, as shown in drawing at right.

The fabrication and assembly of these components into a finished Curtainscreen is a simple job, requiring few tools. As shown in the accompanying step-by-step photos (below), a typical job is started by cutting the components to size. Then, panels are spray enameled in specified colors (presumably, long lengths of panel stock could be color anodized before cutting to size).

The framework of mullions is then partly assembled, and pre-cut panel sections are inserted into mullion grooves at predetermined positions. Proper spacing between panels is maintained by inserting appropriate lengths of filler rod between panels.

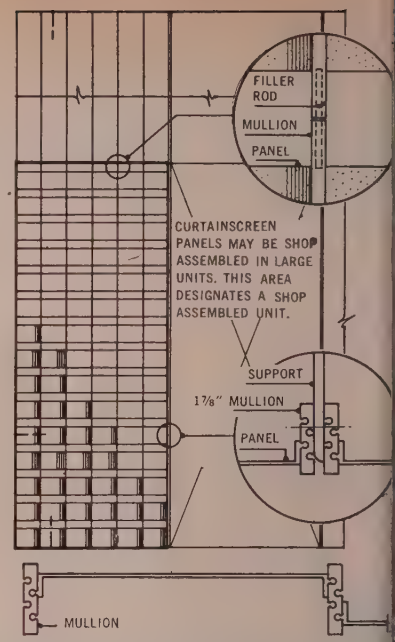
With all panels installed and properly positioned, the assembly is completed by attaching a top bar, which is simply a mullion that has been pre-drilled to take tapping screws or machine screws. (Needless to say, it is also necessary to drill lead holes for fasteners in the ends of the vertical mullions. If machine screws are used, the holes also have to be tapped.)

Insertion of a closure into grooves of the top bar completes the job, and the screen is ready to be installed. Obviously, this assembly procedure is best performed in the shop, by experienced personnel, but many screens can also be assembled on site.

According to Julius Blum & Co., the framework of mullions provides sufficient metal thickness and ample flat surfaces for making whatever structural connections are required for installation. The interlocking slip-fit method of assembly produces a structure having ample sturdiness for nearly any decorative screen application.

But adaptability — not strength nor quick assembly—is Curtainscreen's strong point. With the system, the architect can control his design in many ways: By adjusting panel width, length, shape, color, finish and arrangement; by regulating overall dimensions and mullion spacing; and by incorporating materials other than the standard components.

In the case of large installations—remodeling facades for older buildings for example — units as big as 4 by 10 feet can be shop assembled, transported to the building site, and erected in normal manner. Mating mullions of pre-assembled units can be attached to a common support without hindering continuity of design (see drawing above).



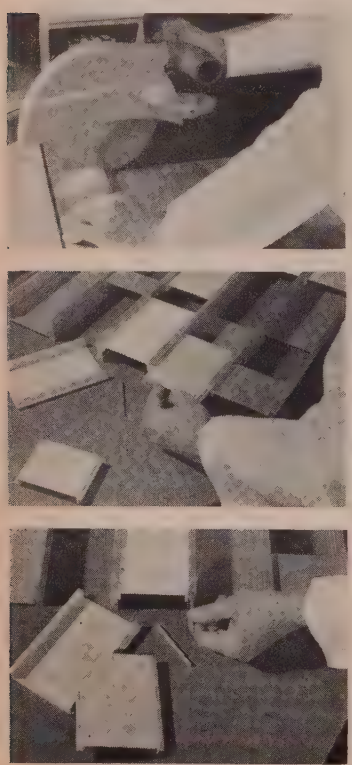
■ ***Details of facade screen show how shop fabricated units can be attached to a common support; how filler rods insure alignment of units longer than 20 feet, and how mullions and panels fit together.***

If space dividers or vision screens must carry electrical wiring, a vertical channel is easily provided by combining two spacers between mullions of adjoining panels. Wiring is thus concealed and protected. If other materials are to be used — glazing, wood or plastic panels, etc. — the Curtainscreen glass stop and snap-in can accommodate panels up to ½-inch thick. For attaching panels of greater thickness, the aluminum closure can do the job. In either case, fastenings will be concealed.

Officials of Julius Blum & Co. believe that architects and designers will find countless ingenious way of adapting Curtainscreen to their particular problems, and perhaps develop applications the company had never considered.

Actual fabrication of screens is not performed by Julius Blum & Co.; it is primarily a distributor of architectural materials to local fabricators and contractors throughout the country. Curtainscreen components are supplied on order to fabricator-erectors, who then cut, finish and assemble screens, usually to architects' specifications.

Currently, the Curtainscreen system is available through some 15-16,000 local outlets.



■ ***Fabrication and assembly of Curtainscreen components: 1. Components are cut to appropriate lengths, then spray enameled, if required. 2. Framework of mullions is partly assembled and pre-cut panels are inserted into mullion grooves. 3. Proper spacing between panels is maintained by inserting sections of filler rod. 4. Pre-drilled top bar is attached. 5. Closure is inserted in top bar grooves.***

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Aluminum Tops in Transmission Towers

Paint-hungry steel structures pose a problem for utilities, while non-rusting aluminum offers long-range economies. Extrusion process puts the light metal in the running, though need for sophisticated shapes makes it a designer's business, ups prices.

by H. K. Darby, Associate Editor

ALUMINUM'S corrosion resistance, light weight and high strength are made to order for structural jobs in the utility field. In fact, aluminum is developing rapidly as the most wanted material in the construction of electric power transmission towers.

The reasons: Steel towers and cross-arms need periodic painting, which means that the particular circuit has to be taken out of service. This causes trouble and expense to the power company, as well as the risk of overloading alternate circuits. Painting the towers is a costly item, particularly when it has to be done on weekends.

Then, steel's great weight creates problems where transmission towers must be erected on inaccessible terrain. Structurals have to be trucked in, which often requires the building of special roads. Where aluminum has won the assignment for such projects, entire assemblies can be flown in by helicopter.

This growing appreciation of the light metal has developed most opportunely for the aluminum industry. Steadily increasing power requirements call for more and more towers, and they will have to be larger in order to hold the heavier conductor that will eventually go into general service.

Aluminum is bound to cut deeper into steel's market. Significant penetration has already been made despite a price that is much greater than steel's.

But aluminum would never have been able to move into competitive range with galvanized had it not been for the extrusion process. This process holds mass to a minimum in a structural member, and puts the metal where it will perform its function best.

In preparation for the big surge in electric power consumption General Electric Co. last year launched Project EHV (Extra High Voltage), an exploratory program based on a new 18-tower, 650KV transmission line put up in western Massachusetts. Operation of this line will give GE the data needed for the efficient design of high voltage equipment. It will also enable the company to study the operation of a complete 3-phase transmission system including relaying and communication.

Aluminum is represented in this line by two towers. Steel, glued laminated wood and pre-stressed concrete are also being tested as construction materials.

However, the light metal's career as a tower construction material was already well along in years. Utility companies began to explore aluminum's capabilities not long after the end of World War II. In 1960 the Philadelphia Electric Co. built the first all-aluminum tower line in the U. S.

Aluminum Made Sense To PE

Facts about Philadelphia Electric's 220 KV line were presented in a paper given at a recent conference of the American Institute of Electrical Engineers by A. H. Sellers, Philadelphia Electric Co., and J. E. Williams, chief structural engineer of Aluminum Co. of America's Alcoa Structural Div'n.

The two companies agree that "aluminum towers are feasible from the standpoint of strength, fabrication and erection, but are somewhat more expensive, initially, than steel."

The biggest advantage of aluminum "is that it does not require painting,"

■ *This V-type aluminum tower, completely assembled, is being flown to its erection site in new 138 KV transmission line of Appalachian Power Co. in Virginia. American Electric Power Service Corp., parent company, flies steel sub-assemblies to sites.*

the paper said. "In the area traversed by the line, there are steel mills, oil refineries, a viscose plant and a coke oven resulting in a particularly corrosive atmosphere. This appeared to be an ideal location for the use of aluminum and a study was made to compare the overall total costs of steel and aluminum."

Engineers pointed out that steel towers in the area must be painted at about five-year intervals; this put aluminum in front by a slight margin "even with the higher cost of aluminum and the higher cost of concrete foundations required for the lighter aluminum towers."

But even if the economics had been slightly in favor of steel, aluminum would have won the Philadelphia Electric assignment because of lower erection costs and the "absence of line outages which occurred whenever steel towers had to be painted." [The chief engineer of one utility company said that with all factors considered, the cost of erecting an aluminum tower runs in the neighborhood of 10% or more under the cost of a comparable steel tower.]

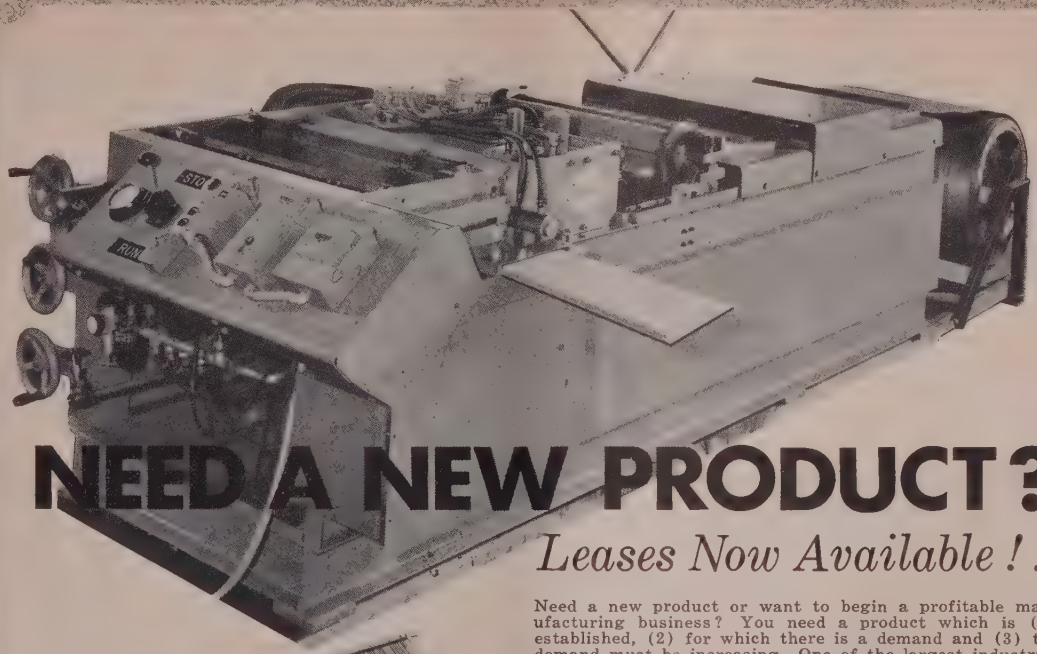
All the towers are 125 feet tall, but the bases of some are 27 feet square, others, 29 feet square. Each contains about 7500 pounds of extrusions.

"All structural shapes — which are standard angle sections — and all plates are alloy 6061-T6," Sellers said. "The only exceptions are the ground wire and conductor attachment plates, which are stainless steel, and the foundation stub angles, which are galvanized. Alloy 6061-T6 is normally used for structural applications because of its good strength and excellent corrosion resistance. It has a minimum yield strength of 35,000 psi and a minimum tensile strength of 38,000 psi." The extrusions range in size from 1¾ x 1¾ x 3/16-inches to 8 x 8 x 1 inches.

Fasteners used for joining aluminum to aluminum and aluminum to steel are ⅝- and ¾-inch diameter hex head 2024-T4 bolts with a No. 205 Alumilite finish. These bolts have a minimum shear strength of 37,000 psi. Nuts are 6061-T6.

Alcoa produced the extrusions at its Cressona, Pa. works, and also fabricated the steel components there. Members were sawed to finished length, coped

(*Continued on page 72*)



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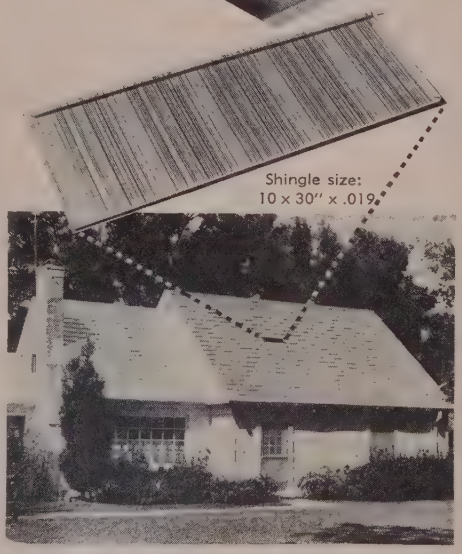

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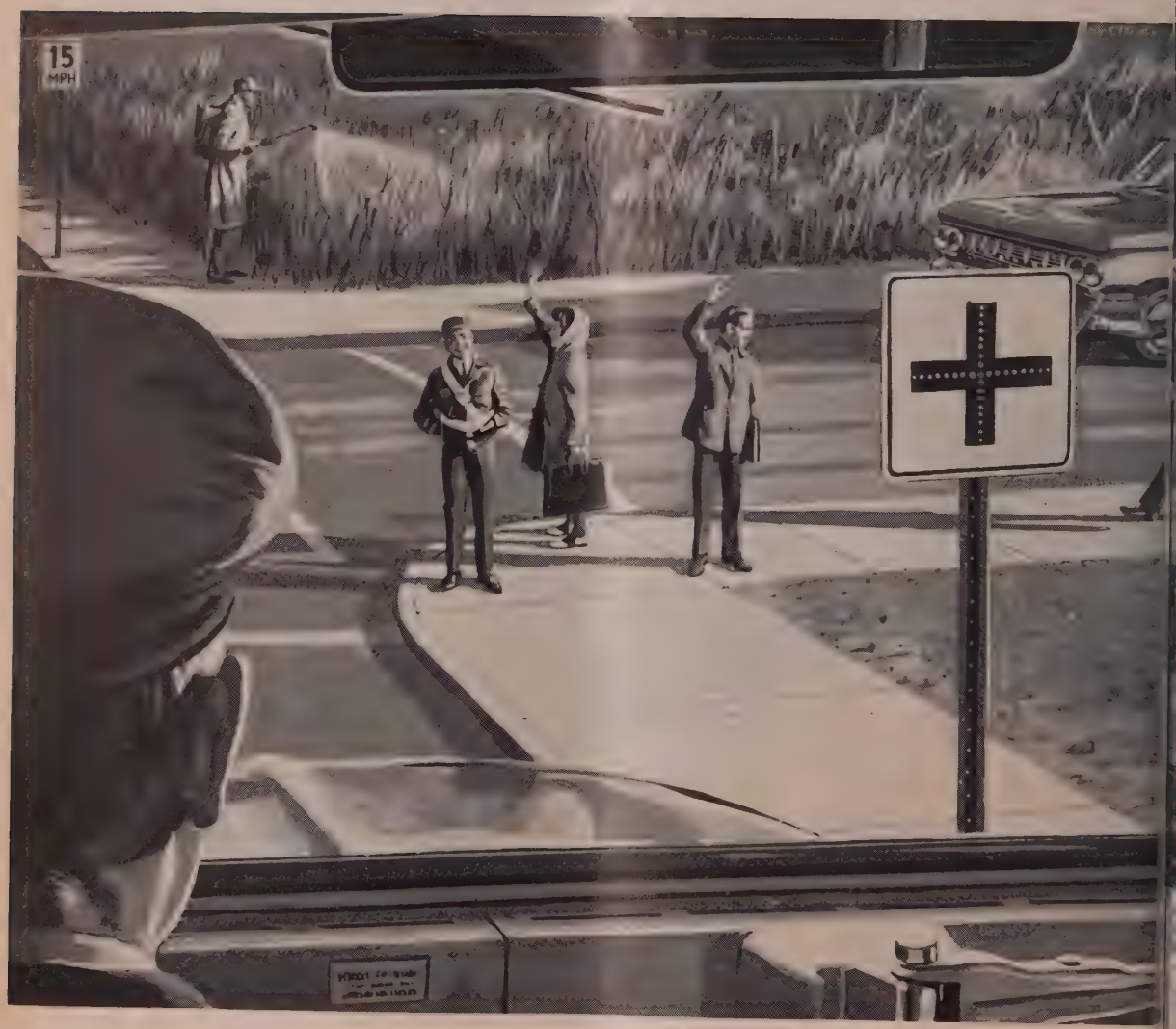

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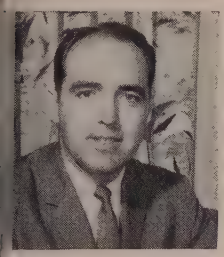

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and mitered and punched, using conventional fabrication methods. Tools for cutting and punching were built with minimum clearances and all cutting surfaces were kept sharp and free from burrs.

The crossarm members and corner posts were formed in the T4 temper and then heat treated to T6. The T4 temper is an intermediate heat treatment stage at which the material is more easily worked. All other members were fabricated in the T6 temper.

Some towers were assembled in sections which were raised into place by a crane. Others were assembled in panels which were hoisted into position by a gin pole. The same number of linemen worked on the tower structure as would have been used if construction was of steel because there was little, if any, change in the number of connections.

However, the aluminum towers permitted use of fewer men to make subassemblies on the ground; most components could be easily handled by one man. The light weight of the pieces compared with steel simplified loading and unloading; no hoist was needed.

"Many of the aluminum bolts broke when tightened with the standard ratchet wrenches used on steel towers," Sellers said. "This was corrected after tests by using torque wrenches and limiting the torque to less than 80% of the minimum breaking strength of the bolts."

The author added that the use of aluminum for complete transmission towers "results in a structurally sound assembly which is easy to erect and pleasing in appearance. Aluminum eliminates the expense and line outages incidental to painting. At the present time, it is competitive with steel when used in industrial areas.

"Further weight reduction in aluminum members can be achieved by future study of the almost unlimited variety of shapes made possible by the extrusion process," he concluded.

Commonwealth Edison Co., Chicago, has an all-aluminum transmission line, and is building another. Its reasons for using aluminum are the same as PE's.

"We are perfectly willing to use aluminum for towers whenever the metal is competitive in cost with steel," a Commonwealth Edison engineer said. "Depending on the surrounding atmosphere, our towers must be painted every five to ten years. Aluminum doesn't require painting."

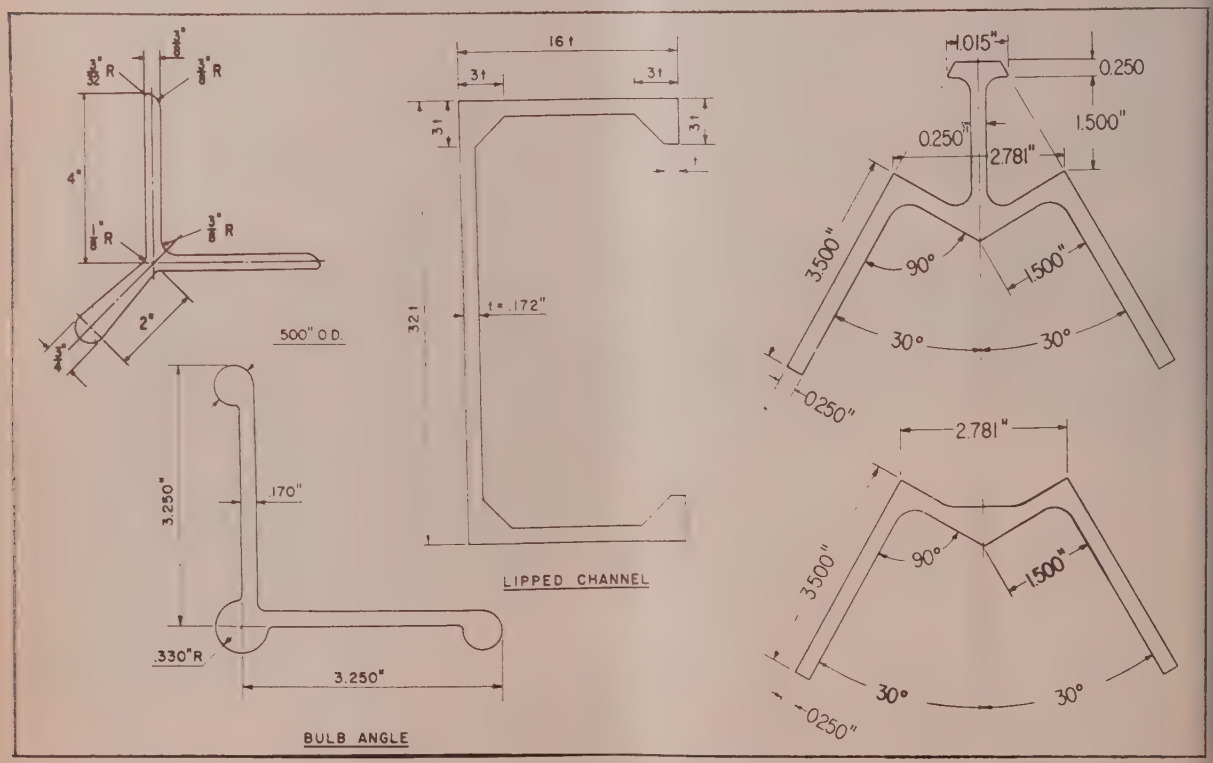
Commonwealth Edison's aluminum tower line is composed of about 50 towers, each with about 4500 pounds of extrusions in it. Aluminum alloy bolts, 5/8- and 3/4-inch diameter, and hex nut are the fasteners.

Commonwealth Edison's aluminum towers are free standing, rather than the guyed-type. While the latter are no less efficient than free standing towers, CE operates in an area where land is fairly expensive. Right-of-way costs are high in greater Chicago, and guyed towers require more land for installation.

Guyed towers require less metal per unit than free standing towers, and are erected faster. But even these attractive qualities for the user cannot overcome high right-of-way costs in most areas. This type of transmission tower isn't seen too often in the U. S.

Project EHV anticipates stiffer requirements in tower design and construction because of the heavier conductor cable used. Thus, towers for extra high voltage lines will call for much stronger structural members to support the giant conductors in a line that might have 16 times the capacity of today's typical 115 kv line.

Tower No. 4 in General Electric's experimental line is an Alcoa-designed all-aluminum tower of free-standing design, preferred by most utilities. Height of the tower is 105 feet, with a rectangular base dimension of 40 x 26 feet. It is designed to take ultimate cable loads of



■ ***Specially designed aluminum extrusions have put the light metal in a greatly improved position in the transmission tower market. Upper left design (Alcoa's) is that of the Y-type extrusion for all-aluminum tangent tower in Project EHV. The bulb angle extrusion (bottom left) and lipped channel extrusions (center) are the main shapes in the Alcan-designed V-type guyed tower (which were produced, then erected by an independent extruder). Right pair of extrusions are used in three-legged tangent tower of United Illuminating Co., 115 KV line in Bridgeport, Conn. Produced by Reynolds Metals Co., top shape was for two legs; bottom shape for third leg. Necessary design work for extrusions to meet varying standards keeps prices up.***

First all-aluminum line was put up by Philadelphia Electric Co. Shown here is one the tangent towers (for straight-line power line suspension) being erected. When e changes direction angle towers are used. This design takes the extra loads called . These are free standing towers and are more popular with utilities.

400 pounds vertical and 30,200 unds transverse plus certain overload tors.

Special Y-shaped sections, tubular tions and standard angles (alloy 6061-5) were used. The section used for ch component was chosen for mini-um weight and cost, according to an EE paper on metal towers in Project HV. Tower No. 4 weighs 15,000 unds, according to Alcoa; a compa-ble steel tower would weigh about ,000 pounds.

The Y shaped extrusion, designed by coa for the tower (see drawing), is ed for corner posts and crossarm mem-rs that are in compression. Y sections re also used for the computed load-rrying compression members in the ansverse face.

"The Y section is a more efficient mpression member than a standard ual leg angle," the AIEE paper re-orted. "It has a larger minimum radius gyration than an angle; hence it can rry a larger column load. Also, the idth of the legs of the Y section is naller than a standard angle which al-ws the Y section to carry higher loads efore local buckling of the legs occurs."

These special shapes were produced two sizes for Tower No. 4. The small-size is 3 x 3 x 1½ (dimension of third g) inches x ½ inch thick for this tra projection at its heaviest point; it pers to ¼ inch, the thickness of the o equal legs.

The other size is 4 x 4 x 2 x ¾ inch, pering to ⅜ inch. Conventional angles this tower range between 2½ x 2 x /16-inch and 6 x 4 x ¾ inch.

Tubular extruded members in Tower o. 4 are in two sizes, 2½-inch o.d. ⅛-inch wall, and 3¾-inch o.d. x ⅛-inch wall. They are used in the trans-erse face as redundant members, and in the longitudinal face both as redundants and as compression members carrying computed loads.

"Tubes are just about the most efficient compression member in tower design because they provide great strength with less metal," a Commonwealth Edison engineer said. "They'll hold more compressive weight per pound of metal than an angle. However, they create problems of fastening.

Fittings Would Boost Price

"The cost of fittings for joining the tubular members in the structure will raise the price of the tower. Generally, the designer will choose a conventional angle of larger size instead of the tube for economic reasons. There are no tubular members in any of our aluminum towers."

Tubes are more efficient compression members than angles because the radius of gyration is equal about any axis, according to the AIEE paper. "Connections were provided by flattening the ends of the tubes. A short tubular insert was placed in each end of the member before the flattening operation to allow forming of the tube without cracking and to provide bearing area for fasteners."

Aluminum Co. of Canada provided the design for Tower No. 8 of Project EHV. This is a guyed V design, 106 feet tall, and is said to be the largest aluminum V-type built to date.

"The extrusion process . . . permits the fabrication of special shapes which have a more efficient distribution of material than is possible with the rolling process," the AIEE experts said. "The bulb angle drawing used for leg chords replaced a standard angle which would have been 36% heavier. The lipped channel (same illustration) forms the lower chord of the crossarm.

"Although bulbed sections could have been used to advantage throughout the crossarm, and would be used in towers built in quantity, standard angles readily available from stock were substituted in many cases. This substitution added about 500 pounds and brought the total weight of structural shapes in the tower itself to 4938 pounds.

"Assembly and erection practices with rigid aluminum towers are much the same as with steel towers. The use of aluminum in the guyed type of tower permits the sub-assembly of reasonably large sections of legs and crossarms at yards along the line."

The paper reported that components can be loaded by hand on trucks for dispersal along the line and can be unloaded and positioned for assembly by hand or with very light tackle. Components for Tower No. 8 were shipped from the shop completely assembled. The contractor had a mobile crane which raised the tower in one piece and held it while the preattached guys were fastened to the anchors.

Although a few all-aluminum transmission lines are in service or projected, the light metal isn't expected to come close to supplanting steel for transmission towers. The evidence points to continued growth of aluminum consumption, but in certain component applications rather than complete towers.

It would be hard to imagine that steel shapes, at about 17 cents a pound, would ever lose out completely to aluminum costing over 40 cents a pound. Aluminum crossarms for wood structures and aluminum top structures for steel towers will doubtless provide the bulk of the business.

The latter application might best be exemplified by the recently completed

■ *Wood pole uprights are still widely used for low voltage lines. Here a 'copter is used for fast installation of extruded tubular aluminum crossarms near Wenatchee, Wash.; they'll never have to be painted and will allow uninterrupted line service.*

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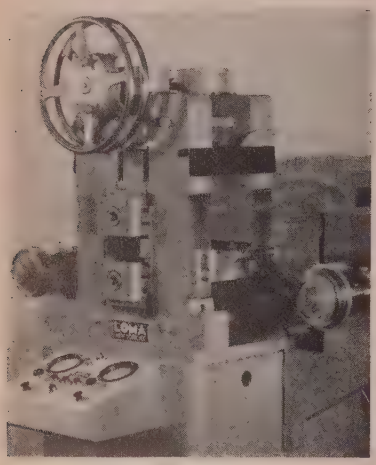

This rugged and versatile reversing 2-high / 4-high combination mill brings high-precision rolling of thin-gauge ferrous and non-ferrous strip within reach of the smaller re-rolling mill, metals pilot plant and research laboratory. Occupying only 35 sq. ft. of floor space and involving a cost of less than $20,000, the machine handles up to 6 in. wide strip at rolling speeds up to 250 ft. per min. with accurate front and back tension control.

The new 8 in. mill is furnished with two sizes of 4-high work rolls, made of either alloy tool steel or solid tungsten carbide: the 1½ in. size is used for normal cold reduction down to 0.002 in. thickness, and the ¾ in. size allows special ultra-thin finishing to gauges of less than 0.001 in. In the 4-high setup, the machine handles up to ⅛ in. gauge; the 2-high arrangement is used for the hot or cold breakdown of heavier materials up to 1 in. thick, but is also available for skin pass rolling of thin strip.

The production of close-tolerance stock is assured by an exceptionally rugged mill design, employing steel housings of 160 sq. in. post area, super-precision needle roller journal bearings of 175,000 lb. separating force capacity, a heavy-duty mill drive with herringbone gearing and universal joint spindles, and twin-hand-wheel worm drive screwdowns. The machine is powered by a four-speed reversing drive offering constant horsepower from 40 to 250 ft. per min. rolling speed.

The outstanding feature of the new machine is its reversing strip coiling attachment allowing the two-way rolling of strip under tension control with no more effort than a mere flick of a selector switch. Mounted on brackets at either side of the mill, the two coiling shafts carry 8 in. diameter reels designed for a coil buildup of 6 in. Both shafts are driven from the pinion stand and are provided with dual air-operated slip clutches and brakes of ultra-sensitive, low-inertia design. Selective operation through solenoid valves and pressure regulators precisely controls the front and back tensions desired for any given mill pass.

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■ *Tower construction employees of Commonwealth Edison Co., Chicago, are shown lifting a section of an aluminum transmission tower into place for the company's first all-aluminum transmission tower line; a second aluminum tower line is going up.*

project of Niagara Mohawk Power Corp., Niagara Falls, N.Y., wherein 200 tower bases were topped with aluminum structures. The Alcoa Structural Div'n designed the crowns. All shapes are angles, ranging from 1¾ x 1¾ x 3/16 inches to 6 x 6 x 9/16 inches. The 200 aluminum units consumed close to 400,000 pounds of extrusions.

Niagara Mohawk decided that the steel-aluminum combination was most economical. The Niagara Falls area, pretty highly industrialized, made frequent painting of steel structures necessary. NM will save money by having upper portion of the towers aluminum.

Alcoa has projected costs indicating that the higher first cost of aluminum will be amortized within 14 years, taking into account initial installation savings and two maintenance paintings. The company estimates that costs of installing the aluminum portions of the towers were approximately one-third less than costs of erecting comparable components in steel.

The Niagara Mohawk towers range in height from 77 to 133 feet. The heaviest aluminum section for one of the 200 towers was 2950 pounds; the lightest, 520 pounds.

Although glued laminated wood and pre-stressed concrete may prove of value in the future, the economics of their production and use are still unknown. At present, they don't seem to cause any great interest. Glued wood is reported to be used in a few transmission structures in Texas, but they are cylindrical poles made from spiral wound, glued laminated veneers. Linemen's pole climbing gaffs wouldn't penetrate the plywood, which necessitated installation of steel ladders. This offered a temptation to small boys and vandals and is frowned on from the standpoint of public safety.

Cast concrete is reported to be in use in transmission poles in Florida and Georgia, where the salt atmosphere is hard on steel.

Wood poles are still an important factor in tower construction. "They're still a valid form of construction for lines carrying up to 138,000 volts," according to American Electric Power Service Corp., New York.

AEP operates six utility companies in the eastern half of the U.S., having a total of 77,300 miles of power transmission and distribution. Recently, its Appalachian Power Co. used a helicopter to install its first all-aluminum tower, a V type guyed structure. Philip Sporn, president of AEP, believes that the 'copter is the basis for new concepts in power line design and construction.

"Economy and speed in line construction are more important today than ever, with the rising costs of all material and labor and the continuing fast growing demands of customers for additional power," Sporn said. "We hope that using helicopters to build these lines will open a new era in this activity."

While Sporn's organization has been using 'copters effectively for steel tower erection, the ability to deliver completed aluminum towers to the erection site is a decided advantage.

Designers' Battle

Meanwhile, the steel producers who serve the electrical field are fighting hard to meet the aluminum challenge. While the battle on the design front continues, the steel industry seems to have another string to its bow. Last month, American Electric Power Service Corp. announced successful development of a stainless steel pigmented paint for steel transmission towers which promises a life expectancy of at least 12 years and probably more.

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Primary Producer Tells Extruders . . .

Profit on ingot and billet is small — new markets must be found — foreign competition destructive — extrusion glut is chronic — industry-sponsored promotion program needed—find new uses yourself—know your own costs.

by D. A. Rhoades, President, Kaiser Aluminum & Chemical Corp.

From a talk given last month at annual meeting of Aluminum Extruders Council

JUST in case there is some suspicion that the integrated aluminum producer is in the highly profitable end of the business, let's take a look at the record. Taking net income as a percentage of net sales for 1960, the three major American producers, Reynolds, Kaiser and Alcoa, averaged between 5 and 5½%. This compares with 9.3% for motor vehicles; 8.5% for chemicals; and 7.6% for petroleum refining.

In net return on investment in 1960, the average of the three major producers was between 2.8 and 2.9%. All primary nonferrous metals yielded 4.9%; the primary iron and steel industry, 5%; motor vehicles, 9.3%; electrical machinery, 5.8%; chemicals, 8.5%; and petroleum refining, 7.6%. The total durable goods industry earned 5.5%.

The facts and figures show that under present conditions prices do not provide a return on our investment that is comparable to other major industries. Maybe it's because we have an exceptional job to do. We must properly sustain research, promotion and market development activities. We must also consider future expansion of aluminum reduction facilities which will be needed to provide the long-range requirements of the expanding aluminum market.

It is unfortunate that through government hearings in years past, the difference beween direct reduction costs and the market price was misinterpreted as "profit per pound."

Profits 'Misinterpreted'

However, I am sure that members of this group know those figures represented only part of the costs, and sometimes represented ideal conditions where everything was running at 100% of capacity and at a time when efforts and funds were primarily directed at overcoming a shortage of aluminum and not the expansion of the market.

It's one thing to figure bare costs on a sold out 100% of capacity operation; it's quite another to figure costs on a basis of the operating levels we have experienced during the last two years.

During February through April we were running at about 50% of capacity, paying for unused power and carrying standby costs and heavy depreciation charges on expanded capacity. The much higher cost of facilities, materials, transportation, labor and the many other essential things we must do to keep the industry growing, have made those old cost figures misleading and incomplete. I am alarmed when someone tells me: "Of course we know you primary producers make at least 10 cents a pound on the aluminum you produce."

Profit: 2.87c Per Pound

The real facts, as published in the 1960 annual reports of aluminum companies, show that in 1960 Kaiser produced some 488,000 tons of aluminum; Alcoa, 727,000 tons; and Reynolds 494-000 tons. Kaiser produced about 23,000 tons more than our sales of 465,000 tons. Our profit before taxes (deleting our profit *before taxes* on our refractory and chemical business) was about $26,750.-000, which resulted in a profit before taxes of 2.87c per pound of aluminum produced and sold.

Similar figures for Alcoa and Reynolds are not available to me, but in studying their annual reports I am reasonably sure that their profit per pound on a similar basis did not exceed ours very much, if at all.

The solution to this problem of bringing the industry's return on investment up to levels of other major American industries, is the very same solution I am going to talk about with respect to your own industry — to build markets that will mean an increasing volume and increasing revenues.

The producers could save millions of dollars a year by cutting out research, development, advertising, promotion and customer services and taking a do-nothing role in the industry. Fortunately, this has not occurred in our country. With respect to foreign markets, however, there exists tremendous neglected opportunities for foreign producers to build new markets for aluminum and to expand the per capita use of aluminum.

I hope that our efforts will not be thwarted by having to utilize funds to combat destructive price competition of overseas producers who are not contributing their share of the cost of expanding the market in the U. S.

But it was not my intention to get out the crying towel regarding the primary producers' problems. Let's take a look at a few of the difficulties you extruders face.

Obviously there is a good deal of chronic over-capacity in your industry. Over-capacity, as such, doesn't have to be too serious. We've had over-capacity in our end of the business ever since the completion of the expansion programs, but it is not chronic. In fact, the order picture is showing a slight upward trend and we've reactivated some reduction capacity during the past 60 days.

Altogether you people do have the capacity to produce far more tonnage than can be sold today. Doesn't that stimulate you to think of market development, application development as a means of doing something about filling that capacity on an industry-wide basis?

A great many problems of the individual extruder would become less critical and possibly some would be completely solved by a significant increase in business.

'To Start Wheels Rolling . . .'

I don't mean sitting down and waiting for the business cycle to come around again and provide greater volume automatically. But someone has to start the wheels rolling. As I see it, a large part of this responsibility lies with those who supply and fabricate basic materials.

The aluminum industry, both the primary producers and the independent fabricators, has since World War II done by far the most outstanding market development and promotional job in the entire metals industry. The cost probably wouldn't be far from 50-60 million dollars per year — work designed to promote and assist the understanding

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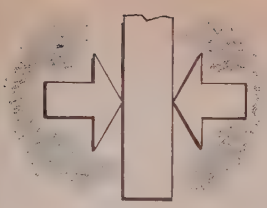

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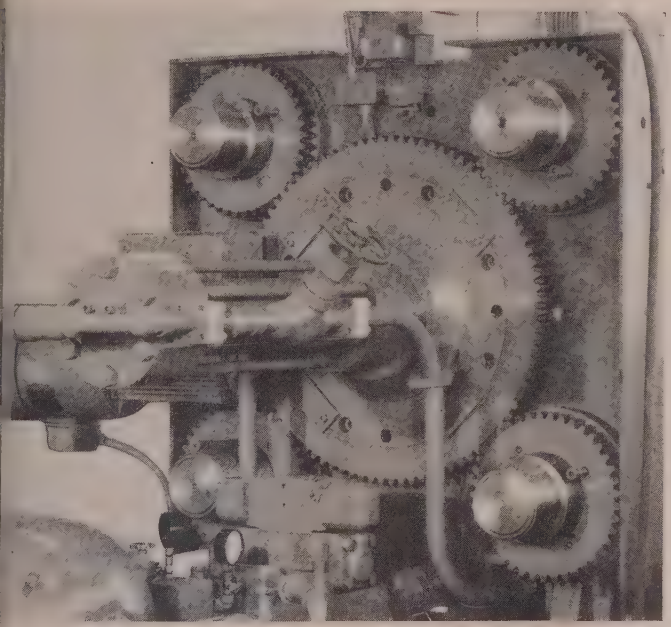

At the touch of a button you can now get die height adjustment for set-up and tonnage control. The Greenlee-B & T system uses a gear-head electric motor to drive a large bull gear which in turn drives a pinion gear on each tie bar nut.

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(2) large bumper bar pattern, both vertical and horizontal, because there is no central screw interference.

(3) large range of die height adjustment normally available with tie bar nut machines without sacrificing individual nut adjustment.

(4) accessibility of hydraulic ejector mechanism.

Greenlee-B & T motorized die height adjustment permits the flexibility of other designs. In addition it provides easier control and adjustment without sacrificing rigidity. Write for complete information.

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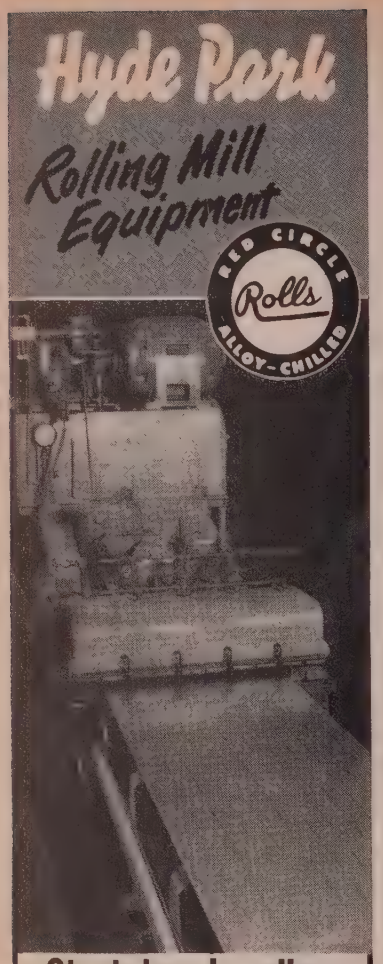

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of and the greater use of aluminum in all its forms.

A good example of this is our Kaiser Aluminum "Breakthrough" program, wherein we solicit directly the interest of industrial designers in extrusion products and application developments. This takes time, money and talent.

I mention this program as an example of the type of effort that any specialized group such as your industry can and should do. It certainly is not limited to the prime producers. In fact, with your close contact with the market in your daily selling efforts, you could do a lot better job.

The job the non-integrated extruder did some years ago in expanding the extrusion market was one of the most outstanding accomplishments in the industry. But as time went on too much of your efforts and funds were shifted from expanding the market to expanding your capacity. This can be all right —provided you do both jobs.

Time for Industry Effort

This is an opportune time for the Extruders Council to embark upon a cooperative program to make your industry, products and services better known.

Unless you, as individual extruders and as a group, do undertake this kind of effort, you are not operating well-rounded businesses. The mere ability to turn out a product on a press when someone asks you for some extrusions does not qualify a fabricating operation as a complete business.

People today don't beat a path to the door of the better mousetrap maker. The businessman must develop, promote and sell as well as manufacture.

A possible prescription would include greater initiative and concept of new applications; giving the best possible service to your customers; maintaining closer relationships with customers over the long-term; volunteer assistance; and doing an aggressive job of telling your market what you can do in supplying quality extrusions. I cannot over-emphasize the value of *service* as a market development effort.

Before you can develop these programs to their greatest effectiveness, you also need market research — an excellent function for an association such as yours. If you know where the market is and where it isn't, you can pinpoint your efforts most efficiently. This is a highly specialized function and should be done by properly trained personnel.

Now let's look inside the business. No operation, no matter how busy, can make money if management does not know its true costs. A professional accounting and auditing system, no matter how small the operation, is necessary simply to know your costs in relation to your prices, margins, profits.

There's nothing like a good cost-of-production system to show you what really happens when you take an order just to get the volume. You've got to know when to pass up business that won't make you any money, and then have the courage to do it!

Small Factor in Shapes

Kaiser Aluminum entered the extrusion business by acquiring the Halethorpe Plant in 1951 and our Doltor Plant in 1956. We felt it necessary to have a complete range of mill product to compete with other primary producers. From 1952 through '60, we continued to be a small factor in the extrusion market, producing less than 4% of the soft alloy shapes.

During this period we were exposed to cost-price problems and as a result of this experience, we concluded that our best interest lay in trying to reach this market through lower cost independent producers. Last year we shut our Halethorpe light press plant — not for altruistic reasons, but simply because we were not making a satisfactory return in that operation.

This leaves us with a very specialized interest in the finished extrusion market. First, develop new products where we can, displace other materials and take advantage of our national distribution. (Our aluminum conduit program is a good example; we have displaced some steel conduit and have well established sales coverage through our wire products to the electrical industry.)

Second, we are continuing to run our two heavy presses in order to give us a complete line of mill products. Aside from these specialized approaches, however, the independent extruders represent our main channel for participation in this market.

'If You Do Not Grow . . . '

If you do not grow and progress in the extrusion market, we do not share in the metal — pig and billet — going to that market. I trust that this will help you think of us in our distinctive position among U. S. primary producers — basically a supplier, not a competitor.

We have many mutual interests, many reasons to strive for the rapid development of markets for extruded products and a healthier extrusion industry. With the normal obstacles that we all face in the day-to-day conduct of our business, with the hazards of foreign competition, with the competition of other materials and the uncertainties of the economy itself, all of us should have plenty of places to use our managerial talents without spinning our wheels with destructive intra-industry quarrels.

Many profit-minded extruders are now extruding Alcan 50S HO as fast as their presses will run.

Here in one aluminum ingot...

much greater extrusion speed... plus good finish and strength

WHEN you run Alcan 50S HO you get greater production ... er day and per machine-hour . . . while still maintaining good echanical properties and finish.

That sums up the experience of many fabricators now using iis much-improved version of the long-time favorite Alcan)S. They're unanimously enthused about its increased press)eed . . . *up to maximum press capacity.*

Because of the all-around performance of Alcan 50S HO, iere is no longer any necessity for stocking a large variety of ingot products. This one ingot takes care of the majority of product runs. Alcan 50S HO Ingot can reduce your inventory as much as 60%.

Alcan of course supplies other types of extrusion ingot to meet special job requirements.

Run 50S HO on your own equipment . . . and clock your production on the run-out table.

For further information on Alcan 50S HO, write or phone your nearest Aluminium Limited Sales Office.

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ALCAN

News Products and People

Center Flow Cars to Haul Alumina for Kaiser

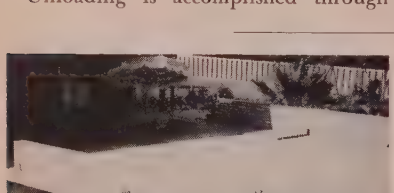
An aluminum hopper car of unique design has been developed by the American Car & Foundry Div'n of ACF Industries, Inc. The car has a capacity of 103 tons, the highest weight carrying capacity of any railroad car in its class. It is the first of 60 of like design and size that will haul alumina from Baton Rouge and Gramercy, La. to Ravenswood, W. Va. for Kaiser Aluminum & Chemical Corp., who have leased them.

The tubular design of the car's body eliminates the center sill, side posts and cross bearers of conventional hopper cars, helping to bring unloaded weight of the car down to 22 tons, compared to 28 tons for aluminum cars of more conventional design, and 35 tons for steel cars. Its payload is close to six tons greater than a conventionally designed aluminum car, and considerably higher than the 90½ tons carried in a steel car.

Unloading is accomplished through eight discharge gates located on the center line of the car, two for each of four compartments.

C. J. Wiehofen, manager of railway sales for Kaiser, said that the major features of the center flow car are its "unprecedented capacity-to-weight ratio, its quick and easy unloading of dry bulk materials, and its ability to carry a great many materials without danger of corrosion to the metal or contamination to the lading."

Each car uses 12,000 pounds of aluminum plate in thicknesses ranging from ¼ to ⅜-inch. The alloy is RCS-H113. An additional 3000 pounds of extrusions are used for sills for each car. The lower side sill is a "dog-leg" angle weighing 13½ pounds a foot. The upper side sill angle weighs 4½ pounds per foot. Over-all car length is 56 feet; it is 10 feet wide and 14 feet high.



Automatic Pool Cover Is Made of Aluminum

Light, sturdy sheets of aluminum are playing an important role today in saving the life of many a youngster through a battery operated swimming pool cover manufactured by Pool-Deck Inc., Bakersfield, Calif.

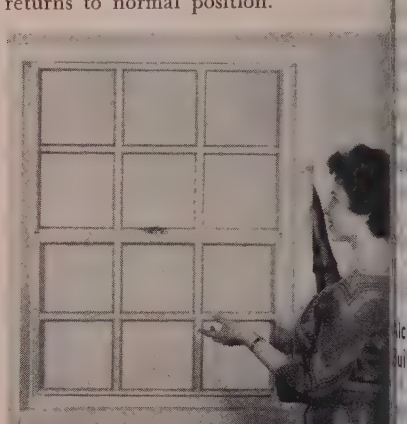
The increase in the rate of child drownings in private pools led to the development of Pool-Deck, which took three years to perfect. Long term design was necessary because designers knew that the cover must be decorative and unobstrusive, as well as sturdy, for it to be accepted.

A cover for a 20 by 40 foot pool weighs only 2,025 pounds. It requires no chains, cogs or other accessories. The aluminum alloy panels are supported for their entire length by aluminum extrusions. The panels are carried by a welded steel frame that folds the deck back at the simple touch of a button. When the pool is not in use, it can be covered in less than two minutes.

The frame carries an automotive-type battery, driving axle, driving wheels and guide wheels. Wheels linked to a gear motor carry the frame. Only white, rubber tired wheels travel on the pool coping. When the panels lower into position, they are supported on the coping by narrow vertical feet. The cover is stored on the shallow end of the pool; does not interfere with diving boards.

Each five-foot cover section consists of two panels connected by a unique hinge. Panels are forced into extrusions with an air tool, and serrations in the extrusions hold panels tightly. The extrusions form the male part of the hinge, over which the female component is placed.

The female hinge parts are made to allow the panels to work with unequal stress. In this way, should one side of the carrier move ahead of the other, the entire panel section can travel in either direction until it rises upon the folding mechanism. It then returns to normal position.



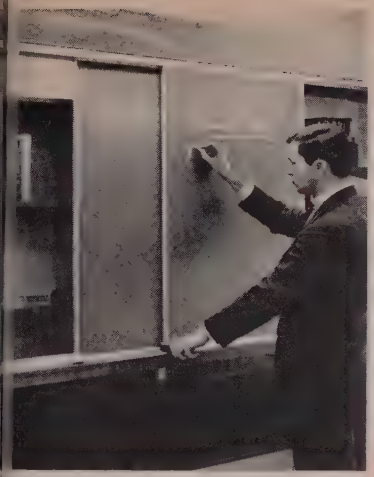
Extruder Designs Full Thermal Barrier Window

Specifically designed to provide full thermal barrier insulation, this new single hung aluminum window is one of the first of its kind to be offered to the new residential and home improvement industries.

Manufactured by Fetter Brothers Aluminum Mfg. Co., Jeffersonville, Ind., the Series 400 window features a combination of bulbular vinyl pile weatherstripping for complete air tightness and effective moisture control. The window forms its own outside casing.

Fetter Brothers is also introducing a new horizontal rolling window with complete thermal barrier insulation and effective moisture control features. The Series 500 window has unusual strength and rigidity.

The new windows are believed to be the first complete thermal barrier models offered the new residential and home improvement industries.



truded Framework Holds fice Storage System

n OMNI Storage System used in a s conference room at Kaiser Center, kland, Calif., points up the versatili- of the system in modern offices and usefulness for storage and display poses, says the manufacturer, Struc- al Products Corp., Inc., Charlotte, ch.

liding blackboard panels, book lves and document storage cabinets d by extruded components run the gth of the conference room wall, ating facilities for use in meetings l presentations. OMNI is flexible and ily installed and may be re-arranged expanded as office requirements nge.

ican To Close Potline, uild Sheet Mill

A high ingot inventory has caused Al- inium Limited to shut down one pot- e at its Isle Maligne, Quebec, smelter. ie shutdown will be effective July h and will reduce the production e by 22,000 tons per year at this 5,000-ton rated plant.

With this cutback, 1961 output of uminum Co. of Canada, Limited's olly owned subsidiary, will be about % of the Canadian company's smelter pacity.

Meanwhile, Alcan has announced that big smelter at Kitimat, idle for the st several weeks while repairs are ing made to a 10-mile-long water nnel, will resume production early in ptember. The job is taking longer n anticipated.

Limited has also moved to double its minum sheet rolling capacity in Can- a. Alcan will spend about $11 million a mill which it hopes to have pro- cing by the end of 1962. It will be pable of rolling wider sheet and plate d larger sheet coils than have been ilable up to now from Canada. Alcan's eet capacity will be doubled—to 60,000 ns a year, the company reports.

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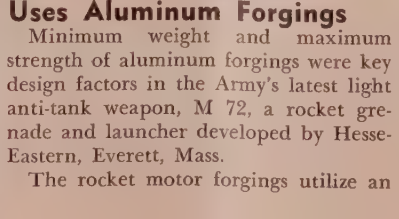
Residential Panels Are Assembled Fast

A new line of mechanically fastened prefabricated panels has been developed by Reynolds Metals Co. The system, designed by Reynolds' product development division, will appear soon on a number of model homes across the country.

Woodgrain embossed Colorweld aluminum sheets, 4 feet wide by the height of the wall, provide the exterior skin for the panels.

Fabrication is fast and simple. In the plant, the sheet and two rows of roll formed batten clips are nailed to the intermediate panel studs. At the construction site, clips are attached right over the sheet at each joint. Then roll formed battens, also woodgrain embossed and prepainted, are snapped on over all clips, fitting tightly and providing vertical lines to enhance the attractiveness of the walls.

The system includes all accessories — skirt boards, inside and outside corners and window trim, and is available in polar white. Other colors, including green, gray and maroon, are expected to be added soon.



New Army Tank Killer Uses Aluminum Forgings

Minimum weight and maximum strength of aluminum forgings were key design factors in the Army's latest light anti-tank weapon, M 72, a rocket grenade and launcher developed by Hesse-Eastern, Everett, Mass.

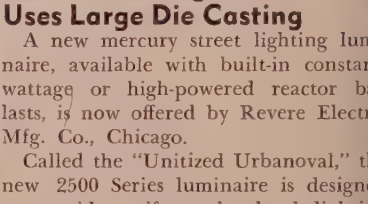
The rocket motor forgings utilize an aluminum alloy claimed to me strength requirements beyond any co mercially available material. The allo developed by Bridgeport Brass Co., its Riverside, Calif. plant, has 85,0 psi minimum strength and 80,000 p minimum yield strength.

Light and accurate, the M 72 can b carried and fired by one man from standing, kneeling or prone positio The 4½ pound weapon is carried ov the shoulder in a dual-purpose thro away case that serves as a launche Collapsed, the carrying case is 25 inch long and 3 inches in diameter. Th outer section is made of a glass fib composition with an aluminum inn section which is extended prior t firing.

The tank-killer grenade is propelle by a new solid fuel motor which de velops maximum thrust before th rocket leaves the launcher tube. Tw high strength Bridgeport aluminu cold forgings make up the powerfu motor for the new low pressure pro pulsion system. When the rocket emerg es, several narrow tail fins spring int position and stabilize the rocket i flight.

The grenade assembly, weighing onl 2.2 pounds, is 20 inches long and 2 inches in diameter. The rocket moto and closure are cold forgings manufac tured to meet rigid specifications; ca be mass produced at minimum cost.

Both forgings are formed on a high speed horizontal hydraulic press. Th rocket motor forging incorporates in tegral lugs which support the stabilizin fins. Secondary operations on the clos tolerance forgings include threading tapping and machining the fin pivots



New Street Light Uses Large Die Casting

A new mercury street lighting lumi naire, available with built-in constant wattage or high-powered reactor bal lasts, is now offered by Revere Electric Mfg. Co., Chicago.

Called the "Unitized Urbanoval," the new 2500 Series luminaire is designed to provide uniform, low-level lighting most desirable for residential areas o secondary streets, using 100, 175, o 250-watt mercury lamps. It features a die cast aluminum housing with inte gral slipfitter in models to fit 1¼-in. or 2-in. pipe mounting arms. The die castings are made by Federal Die Cast ing Co., 2222 No. Elston Ave., Chicago.

ıe Unitized Urbanoval is one of a "family" of Revere luminaires engi- ed to meet the varied requirements ifferent street lighting applications.

Alcoa Award-Winning ject Makes Its Debut

parky, an electric powered runabout gned with urban motoring problems ind, made its public debut in the arcade of Chicago's Merchandise t late last month. The unique vehicle ked sounds of approval among es of onlookers when it was learned it would retail at well under 0 if placed on the market.

lected by the faculty of the Institute Design, Illinois Institute of Tech- gy, for the outstanding student de- employing aluminum, Sparky's de- er, Marnie C. Averitt, has been ed one of six national 1961 winners the Alcoa Student Design Merit rds. The awards were announced Samuel L. Fahnestock, manager of gn for Alcoa, during a special con- nce at the Mart.

n all-aluminum body (5052 alloy in raft-type panel construction) com- sates for the weight of six heavy-duty lt batteries which ride over the rear els under the rear deck. In produc- , a formed aluminum sandwich el chassis could be used. Sparky's un- led weight is about 1000 pounds.

parky has a speed capability of 30 n for 60 miles on one charge. A ger operating on standard 120-volt current is built into the rear end, w the tailgate. Full charge takes t hours; half charge two hours.

he five other Alcoa Award recipi- , all industrial design students are: n H. Bowers, Jr., School of Art, tt Institute, New York, for the phicamper, an amphibian camping icle; David L. Haas, college of Engi- ring, University of Bridgeport nn.), for design of an overhead util- transportation complex; Andrew A. es, Philadelphia Museum College of , for a technique of fastening ninum sheets; Robert C. Taylor, lege of Fine and Applied Arts, Uni- ity of Illinois, for a hexagonal multiple-unit rural mail box; and Charles H. Tipple, School of Art, Syracuse University, for a ski and pole storage-carrier.

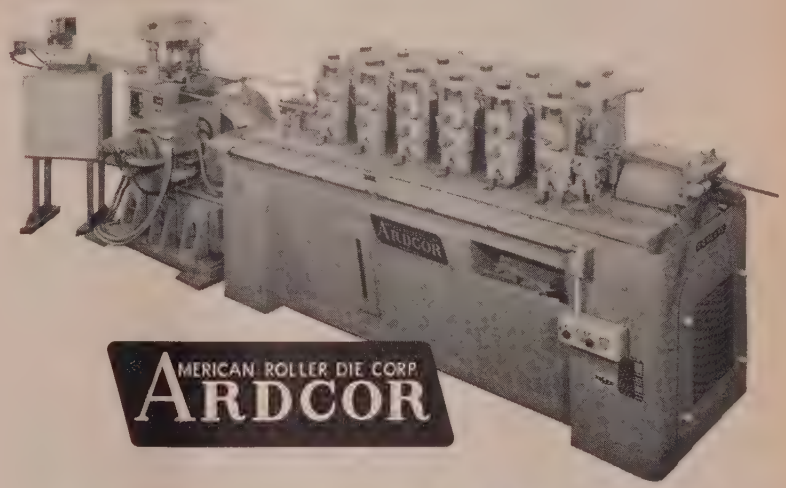
Winners were selected by the industrial design faculties of their respective schools. Criteria for choosing winners are established by the schools.

The awards are one of five phases in Alcoa's industrial design education program — in effect at all schools — which also includes lecturers, a reference library, metal for student projects, and an annual grant of $1000. Winners have received certificates of award, and will be honored in a national advertising program.

Extrusion Lubricant Is Non-Toxic, Won't Stain

A non-toxic extrusion lubricant, that produces stain-free shapes, is a product of The Hodson Corp., 5301 W. 66th St., Chicago 38, Ill. According to the manufacturer, customer reports indicated that use of the powdered concentrate eliminates the use of caustic soda.

The product contains pulverized graphite together with bactericide, fungicide, jelling, bonding and anti-weld agents. One 7-pound package of the concentrate, when mixed with the prescribed amount of water, will produce a 440-pound drum of lubricant.



"Rolling Your Own" CAN'T BE BEAT!

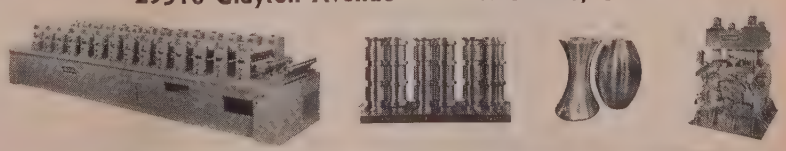
Not when it's on an ARDCOR Small Model "SF" Roll Forming Machine with a Model 10 ARDCOR Cut-Off Press.

There's no contest for low-cost, trouble-free production of small sections. An ARDCOR Model "SF" has all the fine engineering and sturdy construction features that have made ARDCOR'S larger Roll Forming Machines the top recognized producers in the field.

Roll formed shapes can be produced faster, better and at lower cost with ARDCOR Equipment. *Ask us for details and prices on single machines or complete production lines.*

American ROLLER DIE CORP.

29510 Clayton Avenue Wickliffe, Ohio



AMERICAN ROLLER DIE CORP. ARDCOR

Single Roll Forming Machines • Complete Automated Roll Forming Production Lines • Lock Seam and Electric Weld Tube Mills for Ferrous and Non-Ferrous Metals • Cut-Off, Pre-Notch Presses • Slitters • Straightening, Pinch, Leveller Rolls • Pipe Rolls, Tube Rolls, Forming Rolls

John A. Logan, President
Ajax Magnethermic Corporation
Youngstown, Ohio

"WE HAVE BEEN A REGULAR MODERN METALS *Advertiser* SINCE STARTING IN BUSINESS IN 1948!"

Ajax Magnethermic Corporation
YOUNGSTOWN, OHIO

Mr. W. B. Griffin
Modern Metals
435 N. Michigan Avenue
Chicago 11, Illinois

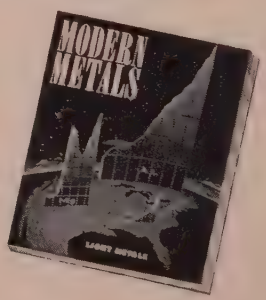
A great deal of our success in publicizing the product we sell to the aluminum field is attributable to the reaction from our consistent advertising in Modern Metals. We have received inquiries from numerous customers that could not have been reached in any other way than through advertising in your magazine.

Our product was not available before 1948 and since that time we have made over 300 installations.

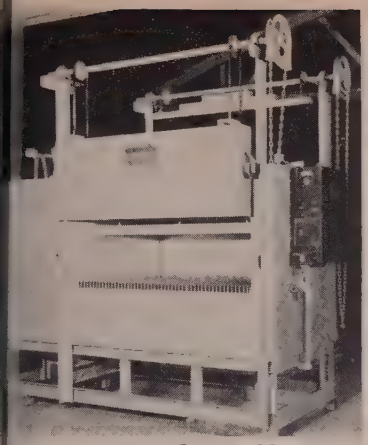
AJAX MAGNETHERMIC CORPORATION
John A. Logan
John A. Logan, President

60-Cycle Aluminum Billet Heaters

"Over 300 installations since 1948"



Aggressive equipment manufacturers know that **MODERN METALS** *is read by the basic market... KNOW ADVERTISING GETS* ***Results*** *IN*



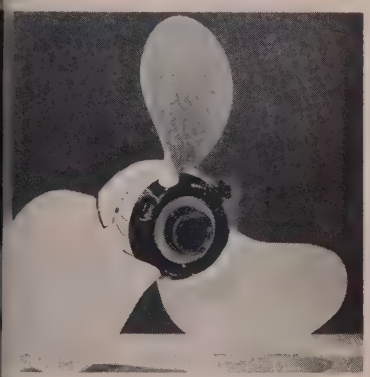
rusion Die Oven Has ety Controls; Twin Doors

gas-fired, vertical-flow cabinet oven gned expressly for heating extrusion has been brought out by Grieve-dry Co., Inc., 1350 N. Elston Ave., ago 22.

easuring 60 inches wide, 30 inches and 18 inches high, the oven is ble of a maximum temperature of °F. Its air circulation system de-s 2450 cubic feet per minute. Air is lated vertically for most efficient sfer of heat to dies.

fety features include an airflow y switch; an M-H combination safe-ontrol with flame failure safety n bell; and a Partlow manual reset ss temperature control. Also in-ed is a Partlow indicating tempera-controller.

ertical lift doors are provided on sides of the unit to facilitate die dling and heating. Capacity of the is 3000 pounds. The unit illus-ed was built for Precision Extrusions, Bensenville, Ill.



w Propeller Stands Up Salt Water Tests

fter a simulated three-year-use test a multi-pitch propeller in salt water, osion was so insignificant as to in-ate that the variable-pitch prop uld be able to outlast the average board motor used in pleasure boat-

The tests, being conducted by the veland division, Alcoa Research Laboratories, in cooperation with Lesnor-Maehr Marine Co., manufacturers of the prop, will go on indefinitely.

The "Multi-Pitch" is a variable-pitch outboard prop for 25-45 hp outboard motors, permitting the user to "dial" any one of seven different pitches—including a low "trolling" pitch on some models—while on the water. The bulk of the prop—blades and hub—are die cast of a high-strength aluminum alloy by Alcoa for Lesnor-Maehr Marine Co., Inc. of Floral Park, N. Y. Over 10,000 of the props are in use in five continents. The propellor shown has not been used.

In Alcoa's controlled salt water testing of the assembled propeller, the entire prop is immersed in synthetic sea water for 10 minutes, then removed to dry for 50 minutes. Temperatures are between 70 and 80°F, and the test has been going on for over 3800 hours.

One test prop had undergone 4560 ten-minute immersions in the salt tank. Close examination revealed only slight flaking of the acrylic finish on the blades, without any damage to the aluminum components. Even though caked with dried salt crystals, the prop's pitch selector ring turned properly and allowed setting of the seven pitches.

Specialists in small seamless aluminum tubing . . . competitive in price with first quality imports.

ALSO SMALL DIAMETER AND THIN WALL TUBING

LaPointe offers a complete variety of operations, all under one roof for maximum quality control and manufacturing economy. Specify LaPointe for the finest seamless aluminum tubing, precision made to your requirements.

LaPointe INDUSTRIES INC.
ROCKVILLE, CONNECTICUT

Write for Complete Details

Introducing Awol, Biggest Aluminum Catamaran

Nearly nine tons of aluminum was used in the construction of this 60-foot catamaran, the largest aluminum, powered boat of its type ever built. Christened Awol III, the twin-hulled craft was built by Aluminum Cruisers, Inc., Standiford Field, Louisville, Ky., for Cata-Marine Corp., Bridgeport, Conn.

Howard Siegrist, president of Cata-Marine, said that his firm and Aluminum Cruisers are planning a 34-foot counterpart of the Awol for quantity production. The boat was designed and developed by Siegrist and George Garcia, president of Aluminum Cruisers, with a styling assist by Arthur Tarabusi, of Reynolds Metals Co.'s styling and design department.

The craft pictured has a 16-foot beam and 3-foot draught, and weighs about one-third less than its steel equivalent. Trial runs on a measured mile indicated a cruising speed of 20 mph and a top speed of 25 mph at 4000 rpm. The boat has two staterooms designed to sleep six or more, and has many conveniences associated with luxury living afloat.

Awol's entire exposed exterior from hull to mast is aluminum. Her big twin hulls are 4½ feet wide amidships and six feet from keel to deck level. Alloy 5086, developed especially for high strength and superior corrosion resistance, was used. The boat is powered by two Gray Marine 238 hp, v-8 engines and has a 5 KV power plant.

Salt Deoxidizes Aluminum For Phosphating, Anodizing

A dry acid salt called Metex M-662 deoxidizes aluminum alloys for phosphating, anodizing, painting, plating or bright-dipping in one fast operation says MacDermid Inc., Waterbury, Conn.

Metex M-662 is nitric, chromic and fluoride-free; disposal of waste solution is simple; reduction is either eliminated or cut down says MacDermid. Other claims: The product produces an active surface for anodizing and an excellent base for any other final treatment of aluminum alloys; the dry powder is instantly soluble in water; it replaces liquid nitric acid and costs far less than 20% nitric.

Metex M-662 has no disagreeable odor, won't corrode tanks and surrounding equipment, requires no special ventilation equipment.

Stainless Clads Aluminum Via Molecular Bonding

Aluminum sheet has been joined to stainless steel through a molecular bonding process, reports Fairmont Aluminum Co., Fairmont, W. Va., who is now offering stainless clad aluminum to industry, though in limited amounts at the present.

Robert T. Farrell, Fairmont president, says that current plans call for the clad aluminum to go to cooking utensil manufacturers. He emphasizes, though, that the product has wide application—as a construction material for liquid storage tanks, as a replacement for automotive parts normally made of stainless, as a basic metal for rockets and missiles.

In commenting on the new process, Farrell said: "Unlike the joining of aluminum to stainless steel by casting, the molecular bond actually unites the two metals so that they are not simply two dissimilar metals — aluminum and steel —but are a single material with desirable characteristics of each metal."

There are no technical limitations as to the gauge of the stainless clad, nor are there any fixed content ratios of stainless to aluminum. A sheet of stainless clad aluminum .050 inch thick would be made up of .009 inch stainless an .041 inch aluminum. This typical stai less clad aluminum sheet would hav approximately half the weight of a sim lar .050 inch-thick solid stainless ste sheet.

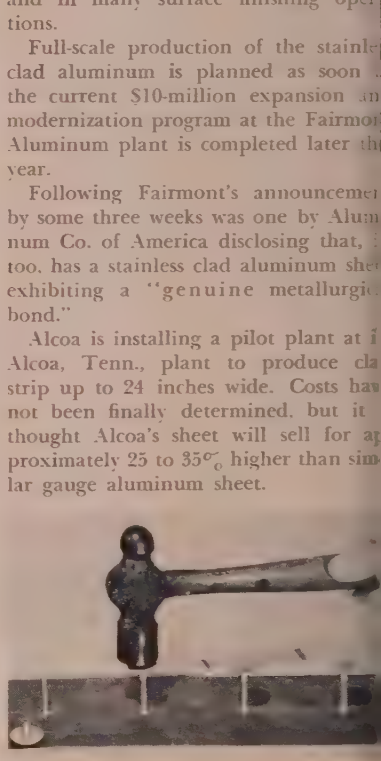
The process for bonding the stainle steel and aluminum was developed b Composite Metals Products, Inc., Washington, Pa. An agreement betwee Fairmont and Composite names Fai mont as licensee and gives it the rig to manufacture and sell the dual meta while Composite retains possession the patents.

Fairmont's clad aluminum has bee tested by several cooking utensil man facturers and reportedly has show excellent metallurgical characteristi during deep drawing, stamping, trim ming, beading, spinning, arc weldin stud and spot welding, brazing, coinin and in many surface finishing oper tions.

Full-scale production of the stainle clad aluminum is planned as soon a the current $10-million expansion an modernization program at the Fairmon Aluminum plant is completed later th year.

Following Fairmont's announcemen by some three weeks was one by Alum num Co. of America disclosing that, too, has a stainless clad aluminum she exhibiting a "genuine metallurgi bond."

Alcoa is installing a pilot plant at i Alcoa, Tenn., plant to produce cla strip up to 24 inches wide. Costs hav not been finally determined, but it thought Alcoa's sheet will sell for ap proximately 25 to 35% higher than sim lar gauge aluminum sheet.



Threadless Stud Cap Has High Holding Strength

A threadless stud cap of 2117 alum num alloy has a positive interferenc lock for high retention strength sa Huck Mfg. Co., 2480 Bellevue Ave Detroit 7.

The new cap is designed for use wit special threadless steel studs and available for either ⅛-inch or 3/16-inc nominal diameter. A variety of shan lengths are provided to permit appli cation over a broad range of materi thickness.

The studs with which the 1-inc Huck caps are used have annul

ves. The cap is installed by tapping nto the stud with a hammer (see co). Optimum interference fit insures tive cap retention in assembly. A with a 3/16-inch cap will resist nuch as 130 pounds removal force. lthough designed specifically for in- ing insulation, the new device be used for other applications where of a fastener of moderate strength tisfactory.

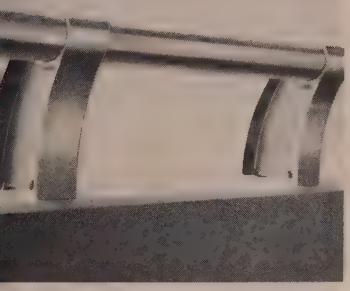
design for the post of the single railing was made to harmonize with existing railings on nearby interchanges in New York and New Jersey. The three-rail design is new.

Two Dow Rolling Mills Producing Aluminum Sheet

Two rolling mills of The Dow Metal Products Co., Div'n of The Dow Chemical Co., are now producing aluminum sheet, the company reports. A 4-hi, 68-inch aluminum sheet mill recently was put in operation at Dow's Madison (Ill.) plant. The mill is fed by Madison's 84-inch reversing hot breakdown mill. These facilities complement aluminum sheet production at Dow's Jackson (Mich.) plant.

Reroll stock and coil sheet in relatively thick gauges are the Madison plant's initial aluminum sheet products. Others will be added later. The Jackson plant specializes in aluminum coil and flat sheet in the thinner gauges.

Dow entered the aluminum sheet market in July, 1960, when it took an option to buy the facilities of Sheet Aluminum Corp. in Jackson. The option was picked up in December.



uminum Railing Saves 0,000 Pounds Weight

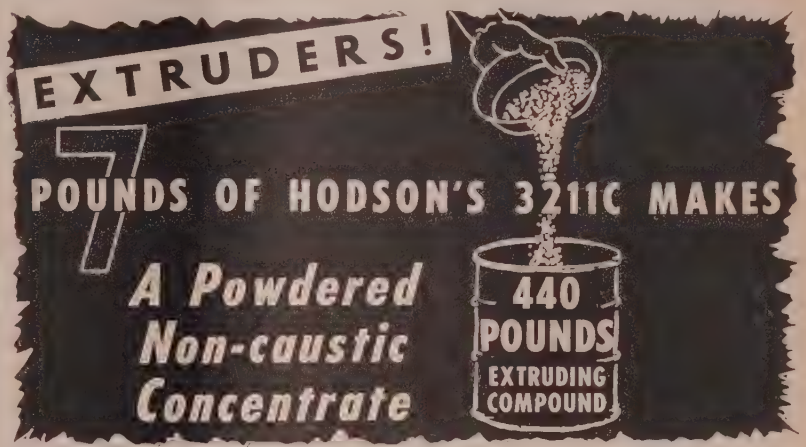
ore than 27,000 feet of two styles of inum railing will add beauty and y to the lower level of New York's rge Washington Bridge which will pened to traffic in 1962. The rail- is manufactured by Michael Flynn . Co., Philadelphia.

ne railing style is a 3-rail design by Port Authority Engineers that will nounted on the edge of the sidewalk will be used as a pedestrian hand- The other is a single rail design tured) that will serve as a barrier on both sides of the lower level's three-lane highways.

hen the original George Washing- Bridge was built, linking upper hattan with Fort Lee, New Jersey ss the Hudson River, provision was e for suspending a second deck or r level directly beneath the original way. The addition of this lower l will increase the capacity of the ge by 75%. The George Washing- Bridge handled 38,446,000 vehicles 959.

he bridge now has steel railings. vever, when railings were considered the second deck, because of weight maintenance consideration it was ded to use aluminum railing. This nt a weight saving of 370,000 pounds mpared to other material.

pecifications for bridge railing ht, weight and style were made up The Port of New York Authority. Flynn company then worked out a gn to meet these specifications. The



Savings up to 66% . . . does a superior job

ADVANTAGES ARE:

(1) Just add water and mix.
(2) Cost per pound of the finished compound at the press is between 4¾c to 5c.
(3) Being anhydrous, shipping charges are reduced (made via parcel post).
(4) No storage or shipping difficulty from freezing or breakage.
(5) Extends die life; reduces down time.

It is the new revolutionary HODSON Compound — No. 3211C Aluminum Extrusion Powdered Concentrate.* Material is anhydrous; is shipped in powder form. It contains the finest micronized graphite; with bactericides, fungicides, jelling, bonding and **anti-weld agents.** All free of occupational hazards and not detrimental to equipment or finished extrusions.

*Patent Applied for

Being used successfully by extruders in all areas of the United States, Canada, and several European countries.

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Mobile Home Builder Wins NASA Contract

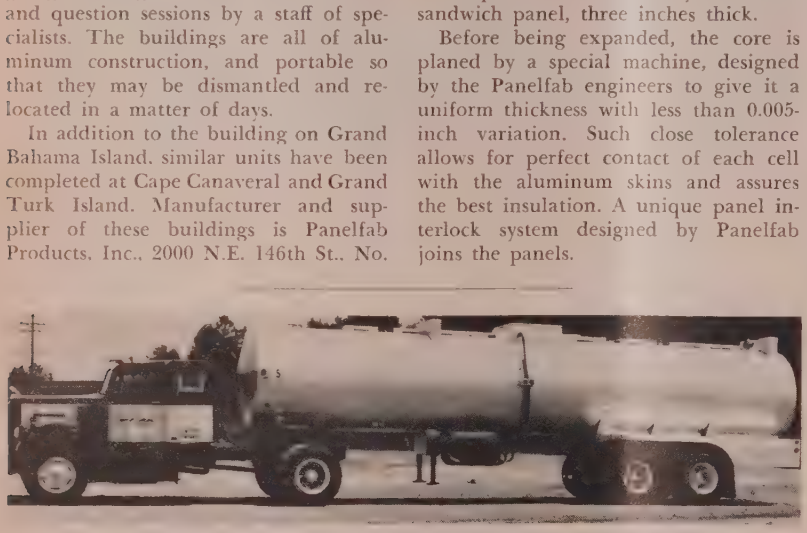
After his historic flight into space, astronaut Alan B. Shepard was flown to a medical and "debriefing" facility built especially for the purpose on Grand Bahama Island in the Caribbean Sea. The National Aeronautics and Space Administration, sponsors of Project Mercury's "Man-In-Space" program, will in due course have ten of these facilities in strategic locations around the world.

Astronauts will spend their first 48 to 72 hours after space flights undergoing thorough medical examinations and question sessions by a staff of specialists. The buildings are all of aluminum construction, and portable so that they may be dismantled and relocated in a matter of days.

In addition to the building on Grand Bahama Island, similar units have been completed at Cape Canaveral and Grand Turk Island. Manufacturer and supplier of these buildings is Panelfab Products, Inc., 2000 N.E. 146th St., No. Miami, Fla. This builder of mobile homes, vacation cottages and portable classrooms designed the buildings, produced the components and handled the construction. It is presently designing the second group of four installations.

Bids for the first three units specified aluminum prefabricated buildings, 20 feet wide, 60 feet long, and an eave wall height of eight feet. The unit has large double doors at each end, and three windows on each 60 foot wall. Walls are a unique aluminum honeycomb core sandwich panel, three inches thick.

Before being expanded, the core is planed by a special machine, designed by the Panelfab engineers to give it a uniform thickness with less than 0.005-inch variation. Such close tolerance allows for perfect contact of each cell with the aluminum skins and assures the best insulation. A unique panel interlock system designed by Panelfab joins the panels.



Pressure-Unloading Aluminum Truck Hauls Food, Chemicals

An all-aluminum tank truck for conveying food and chemical products, and that can be pressure unloaded, has been designed by the Heil Co., Milwaukee, and built by the firm for Tank Lines, Inc., Richmond, Va.

With a 6000 gallon capacity, the tank can be unloaded quickly at 35 pounds of pressure. It was designed specifically to haul such products as fertilizer solutions, petroleum products, transmission oil, animal greases and fats, molasses, vegetable oils or resins.

The truck consists of an inner tank of 5052 aluminum alloy sheet, an outer jacket of the same alloy, and 3 inches of fiberglass insulation between.

The inside of the tank is smooth bore, with no internal structural members or lining, making it easy to clean. The company now is making similar insulated tanks for other customers, to individual specifications.

The Heil Co. has been a pioneer in the use of aluminum for truck applications. "The big emphasis today is on greater payloads," says Joe Heil, Jr., sales manager, "and for this reason aluminum is being used increasingly."

In the new truck, aluminum construction permits a 4 to 6% increase in payload.

Men-on-the-move

Clarence C. Hanson, formerly vi president in charge of sales, has be named vice president and general ma ager of Ajax Magnethermic Corp Trenton Div'n in Trenton, N. J. He in charge of induction melting equi ment. At the same time, **James K. M Laughlin** moves up from assistant di sion manager to vice president of t firm's Youngstown Div'n.

William E. Campbell is now manag of Reynolds Metals Co.'s aluminum r duction plant at Troutdale, Ore. H succeeds **V. G. Kneeskern** who was r cently promoted to assistant gener manager of the reduction division.

The appointment of **Albert J. Boo** as general manager of the Chicago pla of Stewart Die Casting Div'n of Stewa Warner Corp. was recently announce

Fred Kamena has been appoint chief design engineer, Hydraulic Pre Div'n, Youngstown Foundry & Machi Co., Youngstown, Ohio. He will wo along with two new sales directors expand the firm's extrusion press bu ness. The new sales personnel are **Sta ley T. Bowden,** who will headquarter Youngstown, and **Joseph Mein,** who w work out of Montreal, Canada.

Frank M. Cashin has been elect president of the Refractories Div Kaiser Aluminum & Chemical Cor Oakland, Calif.

John H. Eikenberg has been elect president of Revere Copper and Bra Inc., New York, succeeding **Charles Macfie,** who has retired. Eikenberg al becomes a member of the firm's exec tive committee. At the same time, **W liam T. Bertier** was elected vice pre dent and general manufacturing ma ager and **Fritz C. Hyde, Jr.,** a memb of the board of directors.

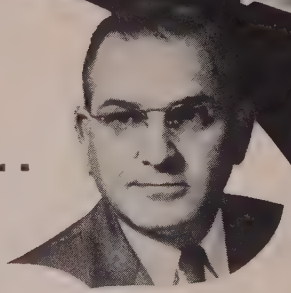
Produce Extra-Clean Ingot For Remelting Operations

Aluminum Co. of America claims have developed an extra clean alun num ingot said to be excellent remelting furnace operations.

Production of the new ingot, calle induction furnace grade, is accor plished through an added step in th smelting process. The improved metho removes oxides and similar materia from the metal.

Contaminant-free ingot minimizes common deterrent to remelting ef ciency—heavy deposits of oxides an other undesirable solids which cov furnace walls and plug tapping cha nels. According to Alcoa, the new ing minimizes such deposits, and residu which do remain are softer and th easier to ream out.

We Have A Story To Tell . . .



FRED G. SCHULER
PRESIDENT,
GENERAL EXTRUSIONS, INC.

WE TELL IT WITH PAGE ADS IN

Modern Metals

GENERAL EXTRUSIONS, INC.
MACHINING • COLOR ANODIZING • FABRICATION
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Mr. W. B. Griffin
Modern Metals
435 North Michigan Avenue
Chicago 11, Illinois

Dear Mr. Griffin:

Since the company was founded in 1950, General Extrusions, Inc. has enjoyed a generous measure of success. We attribute much of this success to our solid advertising program. In this program we have used—and are continuing to use—Modern Metals as our primary publication.

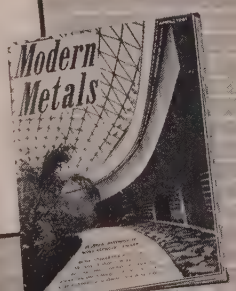
We have a story to tell. While we are equipped to handle a full range of routine aluminum services, we specialize in producing unique, difficult and critical extrusions to the most exacting specifications—plus any type of fabrication and finishing.

We tell this story with page ads in Modern Metals every month. Our case history ads in your publication have been highly successful and have led to considerable new business.

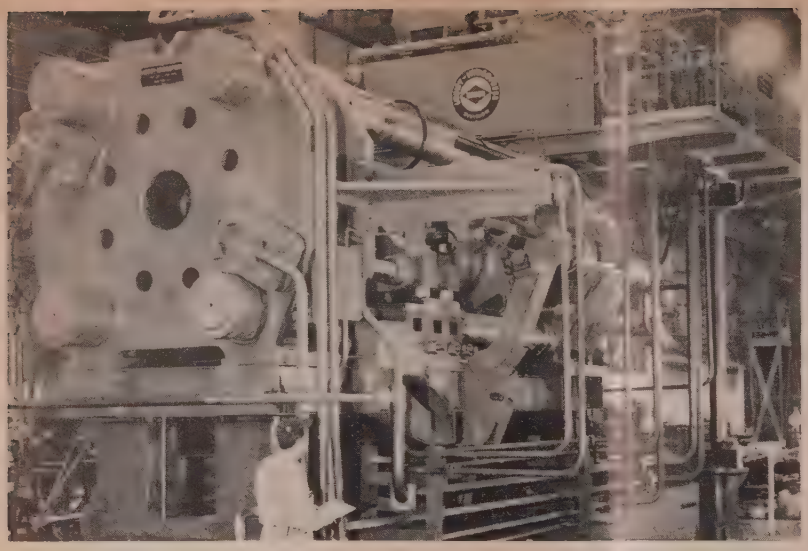
Sincerely,
Fred G. Schuler
Fred G. Schuler
President

SALES OFFICES
PITTSBURGH CINCINNATI CHATTANOOGA GRAND RAPIDS CHICAGO ST. LOUIS CLEVELAND

The standards rigidly observed by General Extrusions, Inc. pertaining to extrusions, dies and manufacturing limits are guaranteed with each order to match or exceed the accepted standards of the aluminum industry.



Aggressive extruders know that Modern Metals is read by the basic market . . . Know Advertising Gets Results In Modern Metals



Press Extrudes Up to 6000 Pounds of Tubing Per Hour

A 3000-ton, self-contained, oil-hydraulic extrusion press built by Baldwin-Lima-Hamilton Corp.'s Industrial Equipment Div'n, Eddystone, Pa., has been installed at Channel Master Corp., Ellenville, N. Y. The press produces 5000-6000 pounds of tubing per hour, in diameters as large as 6 inches.

The press has a dead cycle time of 21 seconds; produces as many as six small diameter tubes simultaneously through multiple-hole dies. Stroke of the main ram is 66 inches; shear capacity is 100 tons: continuous stripping capacity is 285 tons; and continuous sealing capacity 228 tons. A die stack 18 inches in diameter by 18 inches deep can be accommodated.

Design advantages include a fully mechanized system for removing butt ends and dummy blocks; a device which permits billet container changeover in less than half the time required on other presses; jackscrew adjustments for fast centering on billet container; a double slide so one set of dies can be prepared for extrusion while the second set is in operation.

Also included is a furnace-to-press conveyor designed to hold up to 10 billets, ranging in diameter from 8 to 11 inches, and to permit air-cooling of the billets from 1000°F to 850°F—proper extrusion temperature. The delay is said to homogenize the billet and uniformly distribute heat from billet center to surface and to improve physical properties of extruded tube.

During shutdown, an unloading conveyor removes billets quickly. Both conveyors hold billets 1-inch above floor level, elevators lower and raise billets between levels.

The container heater is mounted directly in the container holder to minimize distortion and reduce the number of electric cartridge-type heaters needed. With this arrangement only one electric resistance heater is needed.

Container distortion problems are said to be reduced because there is no need to drill holes in the container itself to accommodate cartridge heaters. Thus, full container strength is retained.

Perfect Aluminum Soldering Method for Air Conditioners

Aluminum tube can be joined in multi-row coils successfully, according to Aluminum Co. of America who have sponsored a practical test of the process. The development should pave the way for broader use of aluminum in air conditioners, the company believes.

The test was conducted recently at the research laboratories of the Selas Corp. of America, Dresher, Pa. Representatives of leading air conditioner manufacturers were on hand. Selas, a manufacturer of industrial heating equipment, developed the technique for performing the joining operation on a production basis.

Aluminum tube is used in single- and double-row condenser and evaporator coils of production model air conditioners, but it has had limited application in larger coils because of purported problems resulting from the intense heat generated when soldering the joints of several rows.

Doubts about the performance of aluminum were dispelled as the joining of return bends was demonstrated in simulated production operation. Te results proved that use of aluminum this application is feasible, and that al minum often can be joined—by t zinc soldering method used in the te —more rapidly and efficiently than co petitive materials.

The finned coils are the channe through which the refrigerant passes it cools the air. Aluminum coils, accor ing to Alcoa engineers, afford the a vantages of about 50% savings in m terial costs, compared with convention tube; and of improved long-ran service.

Better service can be expected fro use of aluminum coils, since aluminu condenser and evaporator fins are stan ard on most air conditioners. Use aluminum for both components elim nates corrosion, which can occur if d similar metals are used in adjacent pa without proper precautions.

High-Speed Cut-Off Machine Introduced

Fifteen hundred cuts per hour a claimed to be the capacity of the ne Beaver No. 14 fully automated, low-co abrasive cut-off machine. Whether t work happens to be tubing, extrude shapes or bars—either ferrous or no ferrous—the manufacturer, Beaver Pi Tools, Inc., Warren, Ohio, said th most shapes up to 3 inches, standa bar lengths, and 1¼-inch solid stoc can be cut with feed strokes fro 3/16-inch to 8 inches. Longer fe strokes can be produced with speci adaptations to the machine.

Features of the new automatic Beav "Speed Cut" abrasive cut-off machi include a specially designed air vi which grips the work securely, a ability to set the machine for sem automatic or full automatic cyc cutting. Air pressure control for cutti

ranges adjusts wheel pressure and ongs cutting wheel life by 30%. d stop adjustments allow the setup ontrol the head stroke for a mini- n of wasted travel time.

he new Beaver automatic No. 14 eed Cut" is powered with a 5 hp, ase, 60-cycle motor. Wheel speed 3000 rpm. Wheel diameter is 14 es. Operating pressure range is 10 100 psi. Air consumption averages n 2 to 4 cubic feet per minute under tinuous operation.

rrs, Scratches Removed ith Nylon Abrasive Pads

uick, easy removal of rust, burrs scratches from all types of metal ng manual metalworking operations id to be possible with two abrasive- icle-impregnated nylon web pads e by Minnesota Mining and Mfg. St. Paul, Minn.

otch-Brite cleaning and finishing s come in very fine and ultra-fine les; are used for scuffing prior to ting, removing slivers and burrs n aluminum parts after anodizing, for general cleanup work. The s are also good for blending welds aluminum and stainless steel, says

ther uses include removal of surface on, handmarks and stains from all ls; cleaning of copper anodes in ing tanks; and scouring of molds to form plastic and glass. The pads be used in hot water, detergents and t solvents and can be rinsed for e.

uminum Being Studied Towel Dispenser

ghtweight paper towel dispensers lar to the experimental model ured are to be made by Alwin Mfg. Green Bay, Wis. for distribution he Bay West Paper Co., Green Bay, bsidiary of Mosinee Paper Mills.

luminum sheet, .040-inch thick, will n the cabinet, using tools and dies inally employed for steel dispensers. shells are formed, then spot welded, r which they are riveted to a steel frame. The aluminum shells are lized for protection.

Roll Formed Shapes Win Same Rates As Extrusions

The National Classification Board of the motor freight industry has granted a request of the Screen Manufacturers Association for a change in the classifications for "lineal shapes, NOI, or moldings, roll formed or extruded." Now the manufacturers of roll formed aluminum lineal shapes have the same rates as producers of extruded lineal shapes. It represents important future savings in motor freight charges to all roll formers of aluminum shapes described in the new Classification Item, including those who make roll formed screen frames.

The change in National Motor Freight Classifications consisted of eliminating "Extrusions" from Item 13260, cancelling Item 13520 related to "Moldings," and establishing a new Item, 13515, which reads:

"Lineal shapes, NOI, or moldings, roll formed or extruded; or extrusions; consisting of one piece of metal; in packages in straight lengths of uniform cross-sectional dimensions, 60 cents per CWT for less truckload quantities; 45 cents per CWT for truckloads.

"Other than straight lengths, or

ALUMINUM BOILER AND MECHANICAL STAINLESS

ABM MEANS TUBING

ESTABLISHED 1845

A B MURRAY CO INC

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straight lengths of non-uniform cross-sectional dimensions, 85 cents LTL, and 55 cents TL."

The traffic committee of SMA, headed by Frank L. Mason of Birmingham, Ala., initiated the action nearly two years ago to win rate parity with extrusions.

Power Strapper Speeds Door Shipping 5-Fold

Powered steel strapping contributes to a greatly increased shipping rate at Fetter Brothers Aluminum Co., Jeffersonville, Ind., extruder and manufacturer of aluminum combination storm and screen doors.

More than five times the number of units are now being shipped than were a year ago, and one man now processes 100 doors in an eight-hour day—more than he was able to handle in a week under the old shipping system.

Credited with the packaging speedup is a powered steel strapping station consisting of a powered strap feed unit and a powered pneumatic steelstrapper. Other materials used are protective corrugated pads and a roller conveyor system.

Besides faster, simpler packaging, the new installation gives uniform, pre-set tension in each strap. After the steel-strapper (picture) is positioned and the throttle pressed, strap take-up is continuous until the proper tension is reached. Then the pneumatic tool holds the tension while the operator, as shown, cuts and seals the strapping with lever.

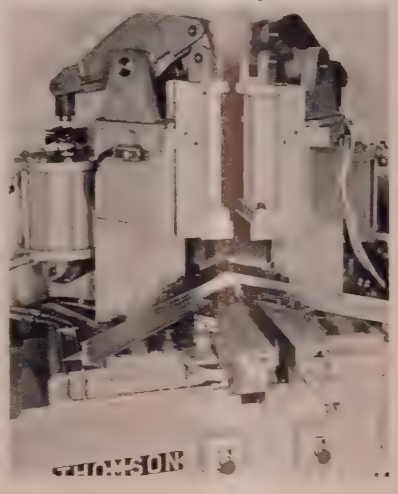
A magazine that holds 100 seals feeds automatically. Strap feed assembly permits one man to strap large packages without helper who would normally pass the strap around the back of the package.

Flash Welder Joins Mitered Extrusions Accurately

A welding machine designed for joining mitered corners of aluminum extrusions has a high capacity bi-directional clamping system, welding dies that nest in the extrusion, and adjustable components that allow up to 1° of angular variations to compensate for part shrinkage. The unit is called the F-3 Thomson Electric Flash Welder and is made by Thomas Electric Welder Co., 161 Pleasant St., Lynn, Mass.

The clamping system holds the work in both horizontal and vertical planes during welding. Horizontal force is 7000 pounds, transmitted to each work piece through mechanical leverage from an 8-inch diameter cylinder operating on 80 psi air pressure. A steel shaft connects the cylinder to a horizontal, mitered bronze die that moves in to clamp the work against a rear mounted stop.

Timed to coincide with the completion of the horizontal clamping, the vertical clamps descend to apply 10,780 pounds of force against the surface of the work piece. When all clamps are close, the work is aligned to give exact perpendicularity in the resulting joints. Variations in this angularity can be determined during trial runs and compensated for.



The vertical clamps and welding dies are machined to conform to the geometry of the extruded member; hardened steel pinch-off dies aid weld quality by removing up to 90% of excess weld material on appropriate surfaces and providing additional support for the work during the forge cycle.

Welding cycle is controlled by a Synchromatic mechanism that produces 13,000 psi upset force at 80 psi air pressure through the movable right-hand plate. This arrangement provides a flashing cycle that follows a true parabolic curve, and the transition between flashing and upset occurs so that upset acceleration greatly exceeds that obtained through conventional cam or hydraulic machines. This action measurably enhances weld quality when joining non-ferrous metals, says Thomson.

Variables—amount of flash-off and upset, flashing time or speed, upset force and current cut-off—can be set without the necessity for developing and changing cams. Reference scales on the unit allow the machine operator to adjust for preferred joint properties. Production on welding techniques may be recorded and changed as required.

An optional feature is a device that automatically sets the gap between work sections for each weld cycle.

One end of the cabinet type frame contains a 150 KVA water-cooled transformer, a thermal protective device and a series parallel terminal board with 16 heat settings. The transformer is enclosed and removed from the flashing spatter. Side mounted controls for the welding cycle include two Type Ignitron tubes and two auxiliary load resistors for 400 volt operation.

Insulated Lap Siding Offers Building Short-Cut

A Dayton, Ohio, home builder applies aluminum insulated clapboard siding directly to studding and saves substantially on labor and materials.

By combining this technique with other advanced building methods, Huber Homes, Inc. is able to produce a 2,030-sq. ft. home with eight rooms and two baths for $14,500 (not including cost of lot).

Applying insulated aluminum siding direct to studs has been recognized by the Federal Housing Administration for use in residential home construction. The new two-story Huber Home, called the Executive, combines brick on the first floor with aluminum clapboard siding on the second floor.

Formerly, traditional wall construction for homes included a brick or wood exterior, a layer of insulation, lath, a coating of rough plaster and one or two finish plaster. With the application of insulated aluminum siding, a builder now can provide a strong, top quality wall structure that involves only the siding, the studs, and an aluminum foil backed dry wall (plasterboard).

Effective insulation and sheathing are provided by the siding, which is backed with foam plastic insulation and a barrier of aluminum foil. The foil-backed plasterboard provides an excellent interior wall surface with additional reflective insulation provided by the aluminum foil.

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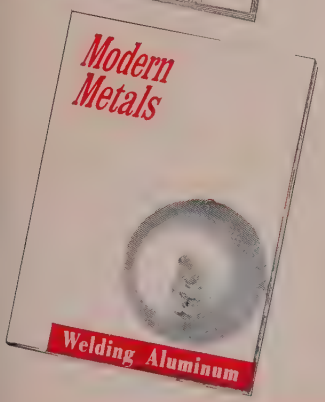

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ooking Ahead

inum prices will go up soon, we predict. They will gradually edge back up toward published prices, come fall. This will have greater effect than an increase in "book price' – which seems most unlikely, despite current desires and rumors. Overall aluminum price structure at the moment is about 20% under book prices – a most unhealthy situation.

s are the most depressed in the 75-year history of the aluminum industry. Problems include overcapacity, commodity pricing, over-optimistic growth chart-artists, a lull in new market developments, inexperienced businessmen, no-account salesmen, and so forth. The big factor, perhaps, is lack of leadership. Even top industry men admit it. While better-heeled firms might like to curtail production and wait until the market strengthens or the price cutters die, they also have to think of the bankers and stockholders. All are heavily in debt; most need more money to operate on; some want to expand abroad.

e domestic aluminum producers are going all out to maintain the 26-cent ingot price, the stuff keeps coming in from abroad at 2 to 3 cents a pound lower (or about the same price it sells for "on the table" in Europe and elsewhere). In many cases they must meet the import price or lose the business. It's a rough situation; can't get much worse unless it breaks wide open. Meanwhile, U.S. exports of primary aluminum are off 50% so far this year, while imports are holding at 1960 levels. But exports of aluminum scrap (used to make low cost ingot) are currently at a five-year high. So the two-way stretch is on.

: of aluminum billet was cut about 4% last month (little was being sold at market prices anyway). The new price is down 1.1 cent to 27.2 cents a pound – or only 1.2 cents above the ingot price. This applies to alloys used in building products – the bulk of the market. No surprises here. Looks as though it won't be long before ingot and billet are priced the same. So in the future the decision of whether to make or buy billet will depend strictly on aluminum scrap prices, or low-priced foreign ingot.

inum wire business is in bad shape. The cold heading market is all but dead and some users are buying aluminum fence wire at under the market price for rod. Screen wire business isn't much better; price was recently cut from $6 to $5 per roll by some outfits. When you consider that a roll contains about seven pounds of wire, that's pretty cheap screen. Finally, stock for aluminum Christmas trees isn't being picked up the way it was a year ago. This is the busy season for tree makers, so they must either have a replacement for aluminum, or they're buying the stuff from abroad. Guess which?

Aluminum siding volume is great. Example: A housing project in Philadelphia plans to use 1.3 million square feet of the stuff. But beneath the big volume talk is a rough competitive situation. To tie up big chunks of this business, some sheet producers have extended so much credit to siding outfits that it will take them years to get out of debt. (Reminds us of the over-extended billet credit given extruders several years ago – which eventually bankrupted some of them.) Before it's too late, aluminum firms better understand the dangers of this policy. When unlimited credit (at no interest) is granted to weak outfits, it puts a severe burden on the legitimate operator who tries to pay his bills on time. He has to compete with outfits that have no credit problems.

Can makers are buying aluminum sheet at 2 cents above ingot price – or 28 cents a pound. The price cut came after a can maker trimmed the price of thin tinplate bodies to $18.63 per thousand in an effort to stop citrus packers from starting to make their own aluminum cans. So the battle between steel and aluminum for the $1.5 billion can market gets rougher. Some think prices for can stock may go even lower before October. One sure bet: Steel companies won't let aluminum run away with a big chunk of their 4.8 million tons-per-year tinplate market; will bear down more, if necessary. Meanwhile, about 36,000 tons of aluminum will go into cans this year – about 2% of the total can market. Alcoa predicts that 80% of the 1.7 billion cans used by citrus firms next season will be aluminum. To roll and sell can stock costs at least 5 cents a pound. Thus, the aluminum ingot going into this product comes out at no more than 23 cents a pound. What price commodity? (For more, see "Here and There," p. 16.)

Flat-rolled stainless steel prices were cut as much as 4 cents a pound by Allegheny Ludlum late in May. A month later Ryerson lopped another 5 to 6% off published prices. It's hard to figure the move. This month International Nickel threw in its bomb: a 7.25-cent-a-pound increase in nickel. This forced Crucible Steel to hike its stainless prices, but the industry hasn't followed suit – so far. Since Castro took over Cuba's U.S.-financed nickel mines, INCO can do what it pleases with nickel prices. This puts stainless steel fabricators in a tough spot. Auto firms won't pay more for stainless trim, and steel producers will never crash the building curtain wall business with higher prices. Aluminum firms should thank International Nickel.

Users are ordering more aluminum in July than in a long time. In fact, aluminum shipments by producers have exceeded production for months, although imports probably balanced production and consumption. May and June shipments of sheet, plate, extrusions, tube and castings were up 5 to 10% over the same 1960 period.

—The Editors

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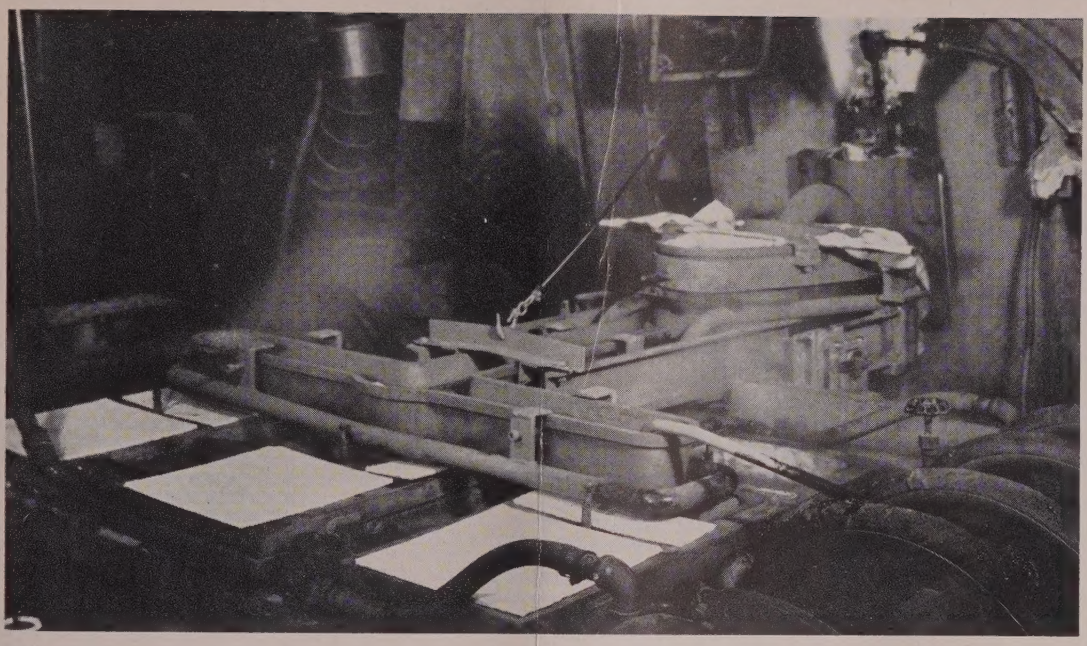

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